American Artisan

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The Warm Air Heating and Sheet Metal Journal

Vol. 97, No. 18 CHICAGO, MAY 4, 1929 $2.00 Per Year

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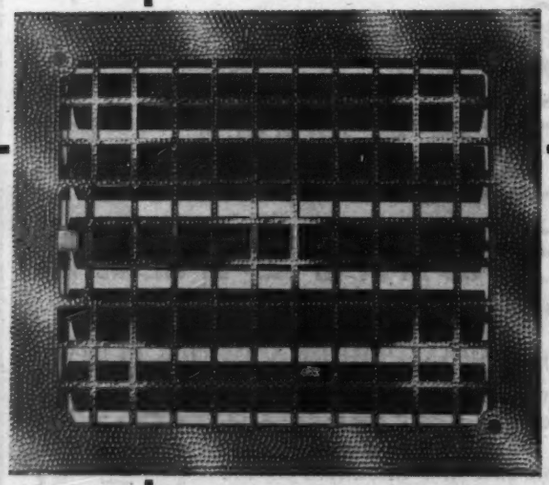
Published Weekly by Porter, Spofford, Langtry Corp., 139 North Clark Street, Chicago, Illinois. AMERICAN ARTISAN—the Warm Air Heating and Sheet Metal Journal—entered as second class matter, March 26, 1928, at the Post Office at Chicago, Illinois, under act of March 3, 1879. Formerly entered on June 25, 1887, as American Artisan and Hardware Record.



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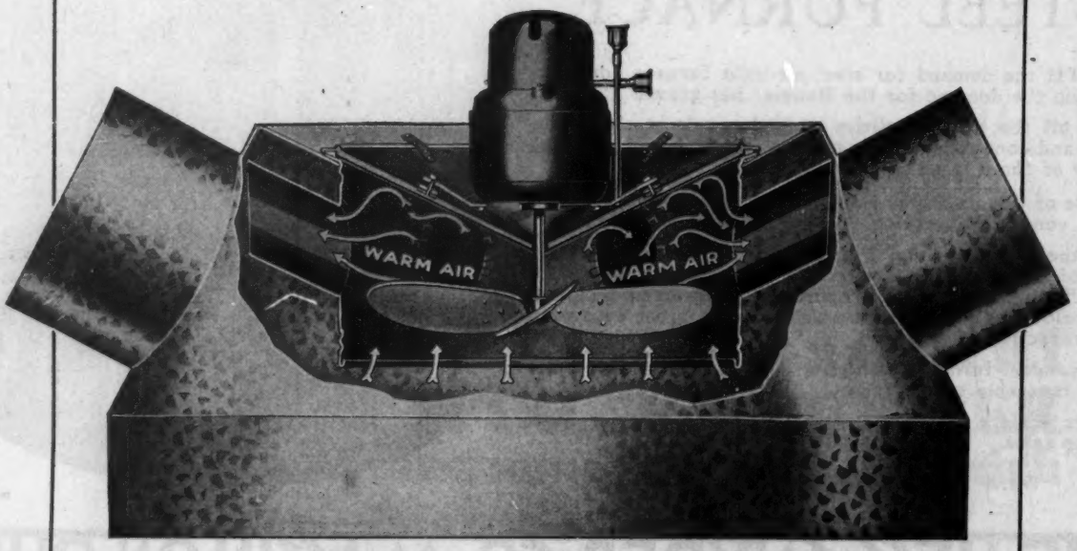

THE public is beginning to look on warm air heating with more favor, folks are being educated to the true qualities of warm air heating through the work of the National Warm Air Heating Association and other organizations.

Furnace Fans are not only easier to sell now than ever before, but they are actually helping to *sell more warm air heating installations.*

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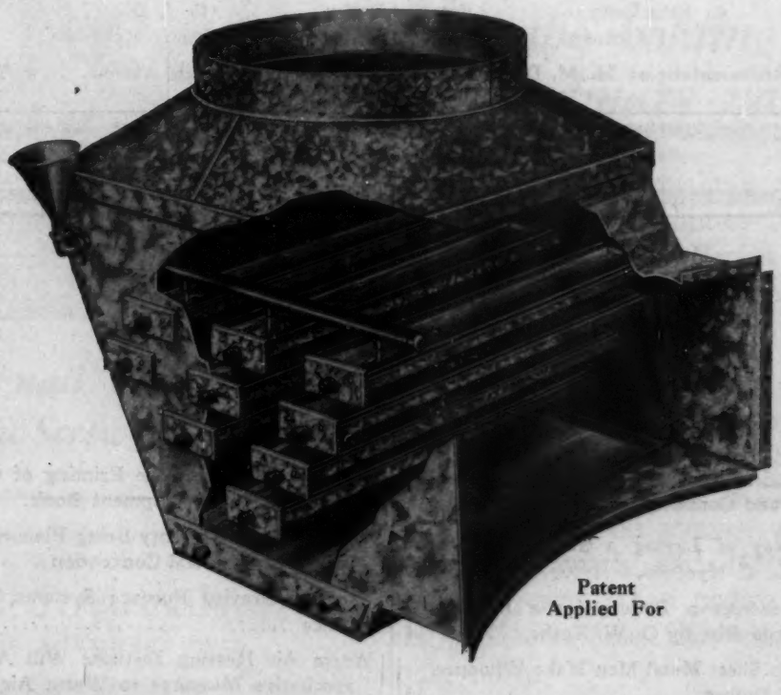
COMBINED AIR CLEANER, HUMIDIFIER AND COLD AIR SHOE



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Applied For

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THIRD: **HUMIDITY.** PERFECT HUMIDITY is created by the cold air passing over the water and absorbing the moisture that is required for a **healthy atmosphere.**

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Founded 1880

Published to Promote Better Warm Air Heating and Sheet Metal Work

American Artisan

The Warm Air Heating and Sheet Metal Journal

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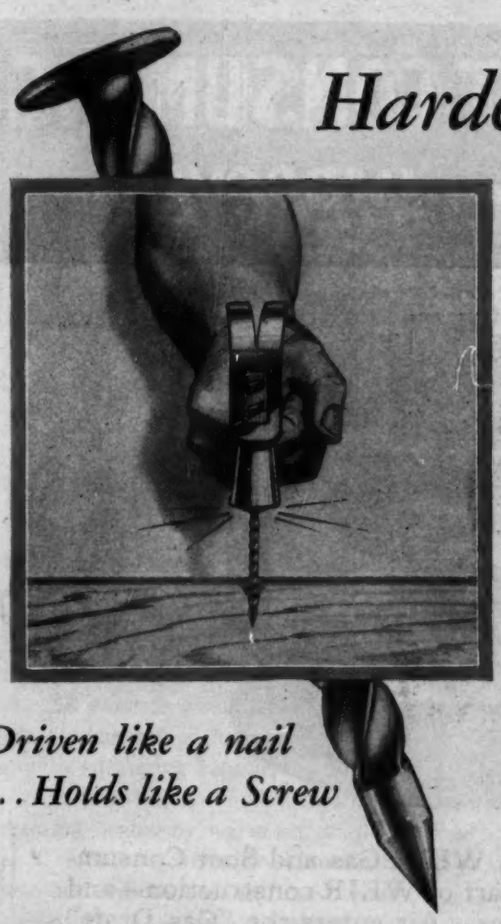
JOY IN LIFE DEFINED

A great deal of the joy of life consists in doing perfectly, or at least to the best of one's ability, everything which he attempts to do.

There is a sense of satisfaction, a pride in surveying such a work—a work which is rounded, full, exact, complete in all its parts—which the superficial man, who leaves his work in a slovenly, slipshod, half-finished condition, can never know.

It is this conscientious completeness which turns work into art. The smallest thing, well done, becomes artistic.—William Mathews.

Hardened Screwnails . . .



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a noteworthy improvement in nails for fastening sheet metal to wood

4 times the holding power of ordinary nails

THE easy driving qualities of a nail and the strong holding qualities of a screw have been successfully united in Parker-Kalon Hardened Screwnails. The result is a nail that is far superior to any nail heretofore used for fastening sheet metal to wood.

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Screwnails cannot work loose, back out or pull out because the hardened spiral thread cuts into the burr in the sheet metal and forms a thread in the wood, holding the sheet metal and wood together as though they were clamped in a vise. Laboratory tests prove that these unique Nails have over 4 times the holding power of ordinary nails.

If you fasten sheet metal to wood, be sure to try Hardened Screwnails. See how much better they are than ordinary nails. We will gladly send samples for testing purposes without cost or obligation.

Hardened *Screw*nails
can be used to advantage by:

Sheet Metal Workers: For fastening cornices, metal ceilings, corrugated siding and sheet metal work generally to wood.

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Fireproof Window and Door Manufacturers: For attaching moulding, trim, etc., to metal-clad windows and doors.

Automobile Manufacturers and Body Builders: For fastening body, door and roof panels, trim pads, upholstery, windbreaks, body, drip and running board mouldings, etc.

Railroads: For fastening roofing and attaching flashings to freight and passenger cars; fastening metal sheathing, insulation, etc., to refrigerator cars; attaching weather strip, mouldings, etc.

and by sign makers, refrigerator manufacturers and others who fasten sheet metal to wood in the manufacture of their products.

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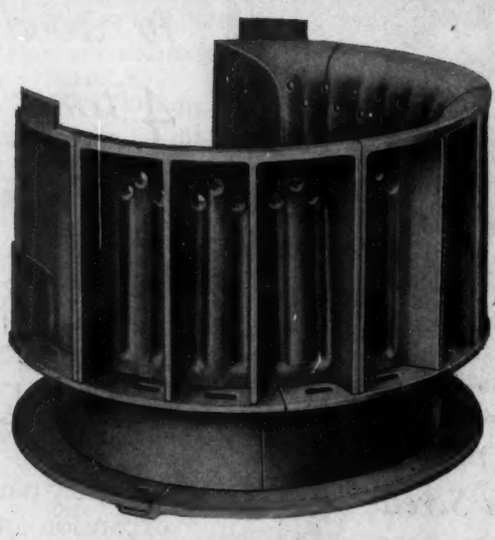

THE famous (patented) WEIR Gas and Soot Consuming fire pot is a main part of WEIR construction—and not just an added appliance. Air enters the "Gas Draft" opening at the front of the furnace and travels around the lower air course thence finding its way up the self cleaning vertical passageways where it enters over the fire thru the holes at the top. This admission of pre-heated air results in the most perfect combustion possible, and in order to prove that this gas burning feature is not a mere "claim" but a *fact*, a Mica window is placed in the feed door. This patented feature *is exclusive* in the WEIR Furnace and provides hard coal and coke results from ordinary soft coal.

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WEIR

Made by The Founders of the Steel Furnace Industry

American Artisan
The Warm Air Heating and Sheet Metal Journal

Vol. 97 CHICAGO, MAY 4, 1929 No. 18

What the Modern Forced Warm Air Job Means to Health and Comfort

How to Interest Prospects in This Type of Warm Air Heating System

By A. E. MUNKEL, Superior Heating Company, Columbus

YOU CAN now enjoy the comfort and pleasure of having every room in your home continuously heated at a uniform temperature. As a means of home heating, warm air has gained in popular favor with surprising rapidity during the past few years. Today, more homes are heated by warm air than by all other systems combined. These installations will be found in homes of all types, from the modest bungalow to the most pretentious residence. This popularity is deserved. Warm air not only does its work of heating in a manner more than satisfactory, but at the same time it contributes vastly to the health and winter well-being of those who enjoy its warmth and comfort.

The forced air heating system not only gives you the means of maintaining a uniform temperature, but it literally forces heat into every nook and corner of every room in your home. There is no longer any reason to feel that some certain room has to be shut off in the winter—no need to pass up the comforts and pleasure of any particular spot for lack of heat. No need to walk with dread into some particular room fearing the temperature will be 10 to 20 degrees lower than the room you leave. You can have your entire building, from attic to cellar, from front to back, from one side to the other, every nook and corner of every room always just the right temperature.

Stressing Necessity of Good Health

Fresh air is an essential to good health and comfort. But fresh air in itself is not enough; it must have the proper amount of moisture and a uniform temperature must be maintained. The forced air system insures comfort and good health by producing and maintaining a constant and complete circulation.

In the accompanying article Mr. Munkel has given the warm air furnace installer some excellent ammunication with which to combat prospective purchasers' leanings toward competitive heating systems.

If the furnace installer will take this article and study it carefully, memorizing the selling points contained therein, he will be in possession of information that will assist him materially in proving to the prospective customer the superior merit of warm air heating.

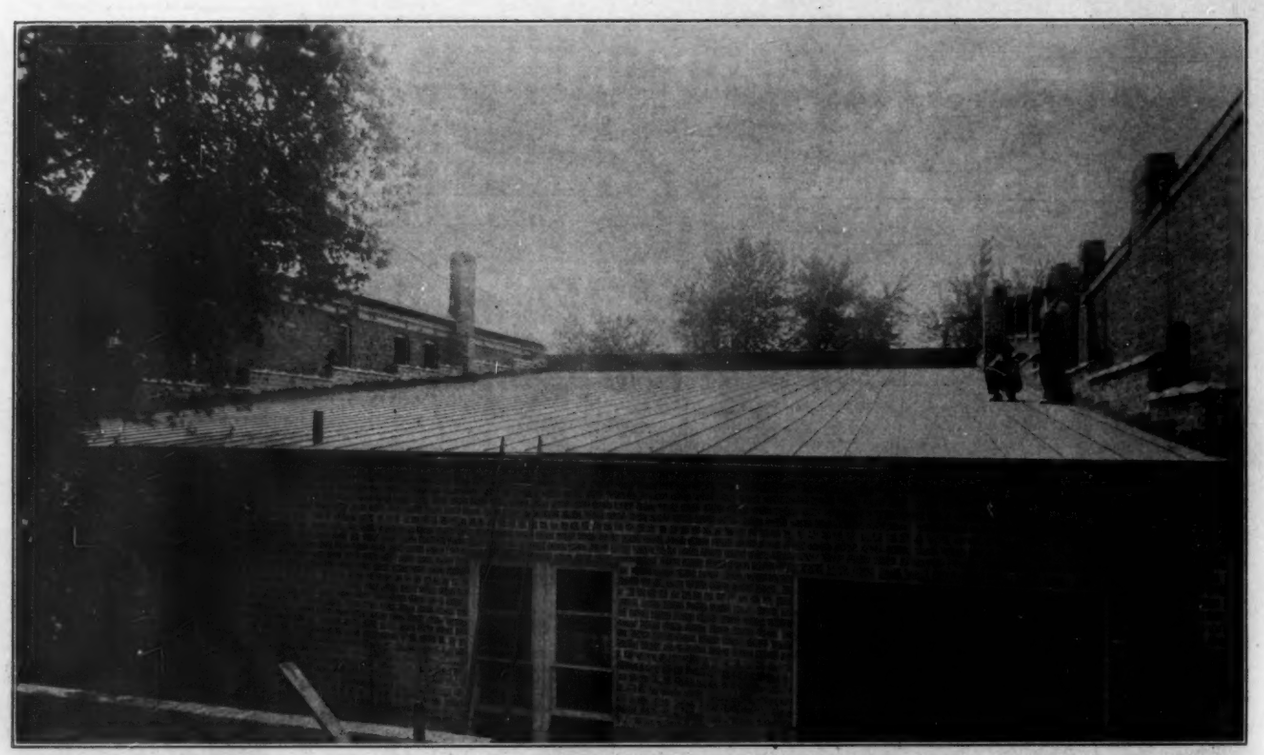
What we need in the warm air heating industry more than any other one thing is merchandising ability. Let's develop it and get busy.

The forced air heating system keeps all the air in every room in constant circulation. Through this circulation it evens up the temperature so that there is practically no difference between the temperature of the air at the ceiling and the air at the floor. This result can be obtained from no heating system other than the combination of your warm air furnace the forced air.

In marked contrast to the hot water or steam job, with the warm air system you have no unsightly radiators to take up the valuable floor space, nor do you have the banging of hot water pipes which, at times, compares to the noise in the ordinary boiler shop. When your warm air job is properly installed with a thermostat or heat control you are able to heat your home to a temperature not varying over one or two degrees; and last, but not least, it is possible to deliver a temperature at your register at any desired degree by the use of an automatic Time-O-Stat.

In this modern day of air conditioning, where it is possible to screen the air, thereby removing all dust particles, and also wash the air through a series of specially designed water sprays, it not only makes for the cleanest manner of home heating, but the forced warm air system is by far the most flexible heating system to be had, and will find itself among the better residences where the want of pure fresh air is the most essential necessity toward health and comfort. Where air is not in circulation, as in the case of the hot water or steam job, where there is no preparation made for humidifying the air, one

(*Continued on Page 26*)



A Standing Seam Roof of the Type Described by Mr. Nye in This Article. This Is One of His Own Installations.

The Nye Way of Laying a Standing Seam Roof Developed After 37 Years of Experience

Some Details About the Work Not Ordinarily Given Attention

By L. C. Nye, Athens, Ohio

IN LAYING a standing seam tin roof the sheets used should never be less than 25-pound coating, 1 c 20x28 in. The cheaper sheets, in addition to requiring painting more often, will not endure. A 40-pound coating should be used if possible. Cornices or stop gutting should never be made of anything less than 40-pound coating. Solder brass seams on all gutter work on both sides so as to solder seams well.

In preparing sheets for laying see that they are cut square on the ends, and if found not to be so, put them on the shears and square them, say 3/8 to 1/2 inch, and edge them and then run them through the cross lock seamer.

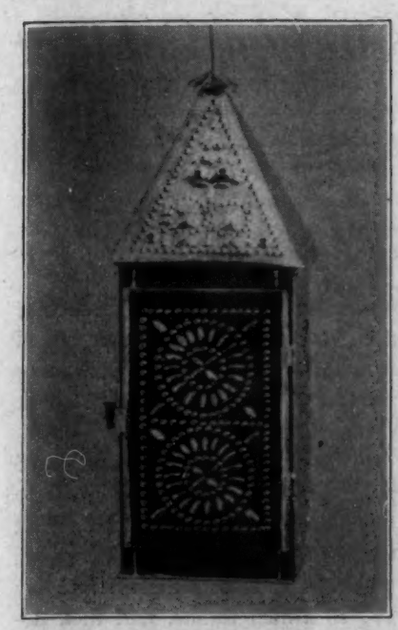
The next operation is to line your bench with a chalk line and have nails driven along this line. Then unroll the sheet on the bench, take a straight edge and smooth out all the slack in the sheet, so that it will lie perfectly straight and flat on the bench. Then you are ready to solder the seams. No one can take tin roofing from the cross lock seamer and lay it, doing the work right, without soldering the cross seams, as the roofing tin will wind, one course winding one way and the next another way, with the result that the material will not be straight.

In soldering the cross seams do this lightly enough to close the seam and keep back from each edge about 1½ inches, so the solder will not hinder you in folding the standing seams. Your roof is now ready for the paint.

I have come to the conclusion that Clintor Metallic paint is one of the very best ironclad paints on the market and is hard to get. Always buy your paint in dry form and mix it with pure raw linseed oil, with the best Japan dryer that you can get. Do not use cheap paint on metal roofs. This spoils the whole job.

Mix your paint at least 48 hours before you want to use it and do not put the Japan dryer in until you are ready to apply the paint. If left standing too long with the dryer in it, the dryer evaporates and the substance loses strength. When mixing the paint and the dryer, stir it well, pouring it from one bucket to the other.

Do not use cheap paint brushes, as you cannot paint a roof properly with a cheap brush. A 4-inch brush is the best size to use. If you use a long bristle stucco brush, take a piece of tin 2 inches wide and fold the edges and form it into the shape



The Square Lantern
These Lanterns Are All Made by Mr. Nye from Sheet Metal

of the band on the brush and then solder the ends together, using four carpet tacks to hold band over brush. This will help to hold the bristles together while the brush is in action and being broken in. After a day's use of the brush take the band of metal off. This use of the band during the breaking in period of the brush will add much to its after life.

One of the most important items on roofing is the flux. Rosin is the only correct flux to use, in my opinion, for new roofing work. Formerly I used the powdered rosin, but found that the wind blew this away too readily. I got an old can, cut it down somewhat, and in this mixed about half and half powdered rosin and wood alcohol. Mix this and the alcohol will dissolve the rosin and you will have a rosin varnish. This can be readily spread with a swab with the assurance that it will remain where it is put. Any of the rosin left on the tin must be scraped off before the roof is painted, because if it is left on, sooner or later it will come off of its own accord and take the paint off with it.

Always buy oil finished sheets for roofing work. They solder better and will not rust so soon if rained on before painted.

Never solder a new roof with zinc sulphate, or acid as it is commonly called. Acid will eat through the sheet and ruin the job. In soldering new work to old, or patching old work, always wash the soldered places with water thoroughly and allow it to dry before painting. If this is not done, the acid will cause the work to rust through in no time at all.

Tin for roofing should be painted on the under side and dried before laying on straight roofs, but this cannot be done in laying roofs with hips or valleys. In laying this latter kind of work always work two hips or two valleys or rather two sides of one hip or one valley so that your angle that cuts off to fit one side will fit the other side of the same valley, and if one side is painted, the painted side would be outside.

100-Year-Old Pattern of Lantern

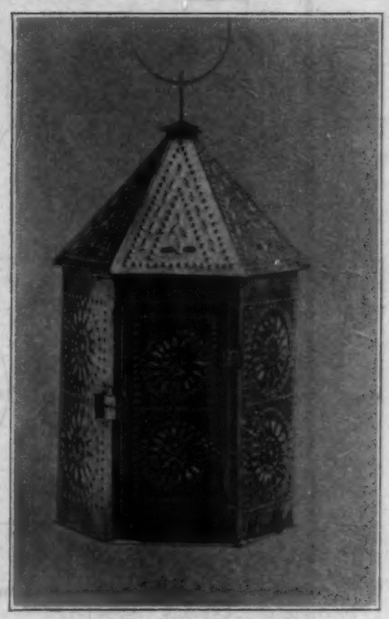
In starting a standing seam roof if a gable or along a fire wall, be sure to start straight. Better measure your distance in width to nail and cleat; use chalk line. Then if you get started straight you will not have trouble. This is especially necessary where the courses being laid are long.

There is used in this section of Ohio what we call a high seam and a low seam. The accompanying illustration shows the high seam, tongued 1¼ to 1½ inches. This roof is 80 feet from eve to front. A roof of that length must have high seams, as low seams would flood with water, especially where the snowfalls are deep and the rains are heavy. The operation of laying the roof are shown in the illustration, starting with the first course on the left hand side, which is tongued up 8 inches and squared to the line with the cleats nailed to get straight at the top of the standing seam, which I kept back 7 inches from the back of the front. Here I stretched a line crosswise with the roof and the standing seam which came to that line. I cut the standing seam back 1½ inches and turned at the head of each course ½ inch edge crosswise. I have a reason for doing this which I shall explain later in this article.

The high seam tongs then brings the bottom of the folding high enough to avoid flooding the seam. Every cross seam was soldered over the roof. Where one roll was joined to another it was lined and the one cross seam was soldered. The roof has 6,200 square feet. For cleating I use ⅞-inch barbed roofing nails, and on the eaves I used 3-ply galvanized nails. All outside nailing is done with galvanized nails.

One thing that must be carefully watched is the folding of the seam.

(*Continued on Page 25*)



Porch Lantern Having 6 Sides

How to Construct a Pattern for a Kitchen Cabinet Flour Bin

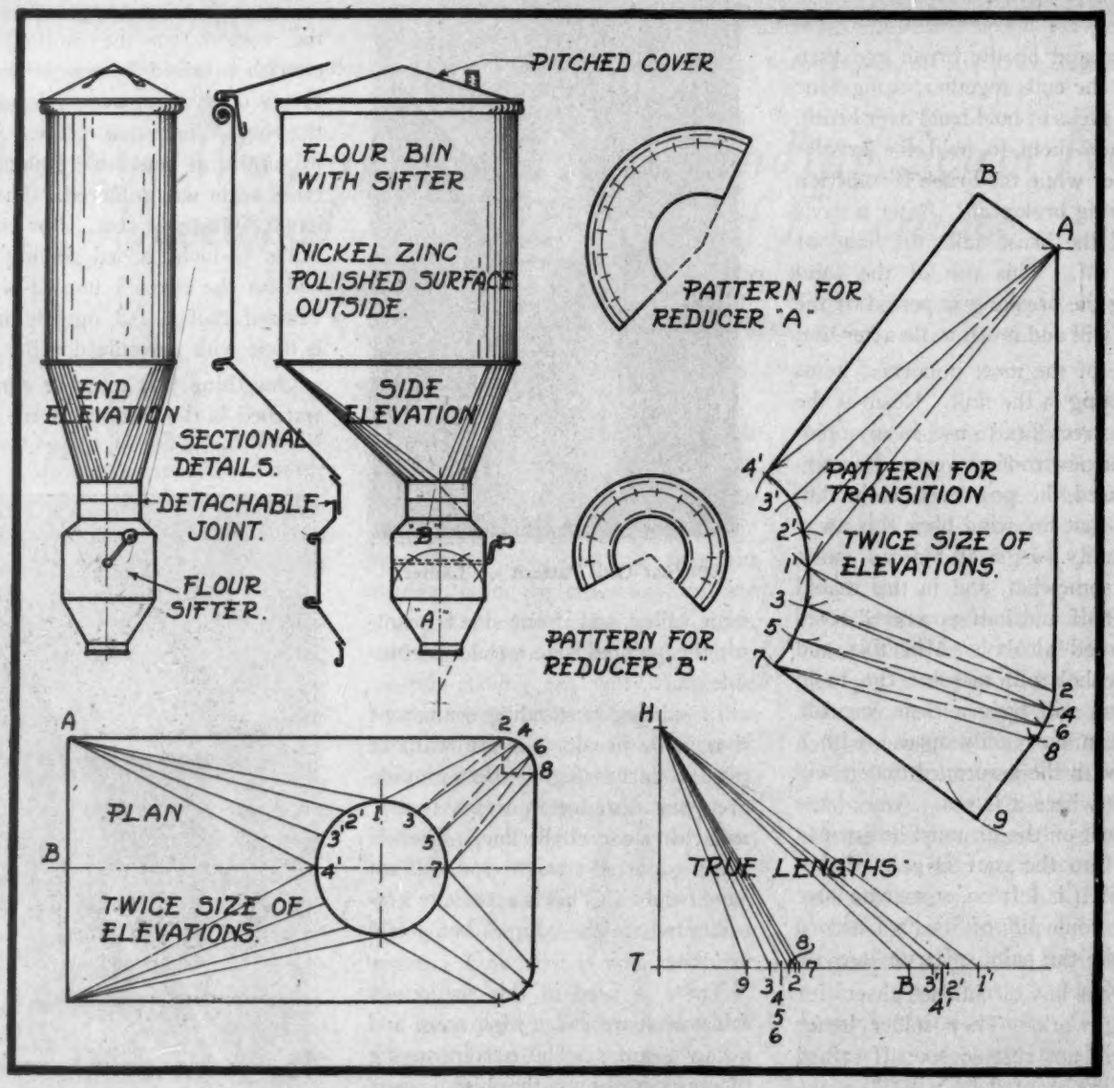
Working with Nickel Zinc a Highly Polished Metal

By O. W. Kothe, Principal, St. Louis Technical Institute

SUCH highly finished metal as nickel-zinc is also very desirable for spice boxes, in kitchen cabinets, also for purposes of demonstration in wholesale and retail establishments. Being that many thousands of tradesmen are employed exclusively on hotel and restaurant manufacturing work, the addition of nickel zinc is interesting. With it a great many exposed fixtures can be made and that stand up as well as other metals and look better.

In our engraving we have a flour bin to fit in a kitchen cabinet. This shows one way of making such a bin, and although such things can be simplified, still this problem involves some interesting enigmas in drafting. Naturally the top bin is made to the height, width and depth the cabinet permits. The same holds true with the hopper and the sifter arrangement. The sifter is made with a slip joint to permit easy removal and also for renewing the screen when need be. In this case the two front corners are described to a quadrant to facilitate cleaning and for appearance, while the back corners are sharp.

So we first draw the outline of plan, which in this case is made to twice the size of the elevation. Next describe the quadrants of corners, making a suitable radius of possibly 1½ to 2-inch radius, and then describe the round collar section to correspond to the size of the sifter.



Kitchen Cabinet Flour Bin

Since the hopper is an irregular shape, triangulation must be used in its development. Therefore treat the full circle in say 12 equal spaces and the quadrants into 3 equal divisions. After this draw lines, thereby dividing the surface into triangles, numbering all points and bends.

How to Determine True Length of Plan Lines

Now to determine the true length of these plan lines we must add altitude to them, as shown in the diagram. Here H-T is equal to twice the height of our elevation drawings and it, therefore, corresponds with the plan. With dividers pick the plan lines, as 1-2, 2-3, 3-4, 4-5, etc., also A-1, A-2′, A-3′, A-4′ and set over from T on the horizontal line of diagram. Observe this process is merely transplanting our plan lines, which form base lines, to a convenient position where we can add one altitude line for all of them. Hence, by joining all these points on the baseline, as 1′-2′-3′-4′, etc., to H, we have the true lengths.

To set out the pattern, draw any line, as A-2, equal to A-2 of the plan. Now use dividers or compasses and pick the true length H-1′ from the diagram, and using A as center, strike an arc, as at 1. Next pick the true length H-2 of the shorter lines, and using 2 in pattern as center, cross arcs, as in point 1. Now the spaces, as 1-3-5-7, etc., represent the girth spaces around the collar, while 2-4-6-8 of plans represent the girth spaces for the quadrants.

Therefore set one pair of dividers to a space, as 1-3, of the collar, and set another pair of dividers to space 2-4 of the quadrant. With compass No. 1 strike arcs 2′-3 from point 1 of pattern, and with compass No. 2 strike arc 2-4 from 2 as center of pattern. Now use a third pair of compasses or trammel points and pick true length H-2′, and using A in the pattern as center, cross arcs as in point 2′. With compass No. 1 strike arc 3′ from 2′, and then pick true length H-3′ and set in pattern as A-3′. Repeat and describe arc 4′ from 3′, and using true length H-4′, cross arcs, as in point 4′. Now pick the half width as A-B from plan and from A in pattern strike arc B. Pick line H-B from diagram, and using the last center 4′ as center, cross arcs as at B. This enables drawing outlines for the back half of the pattern.

To continue with the other half, pick true length H-3 from diagram, and using 2 in pattern as center, cross arcs, as in point 3. Next pick true length H-4 from true neglect, and using new point 3 as center, cross arcs in point 4. With compass No. 1 strike arc 5 and with compass No. 2 strike arc 6 from 4 in pattern, and then repeat the above operation until points 7-9 are established. This permits drawing lines through all points where arcs cross and the pattern is finished.

Pattern for Bin Laid Out as Straight Work

The pattern for bin is laid out as any straight piece of work, picking the girth direct from the outline of plan. Observe the bin and the hopper edge must fit together, and therefore both edges must have the same perimeter. The flaring parts A and B of sifter are developed identical to any true flaring article as funnel or pail or pan. The girth is obtained by either dividing a semi-circle in equal parts as we show or by multiplying the diameter by 3.1416. Laps for seaming must be allowed extra as per the sectional detail. The lap for the wire edge is made equal to 2½ times the thickness of the wire, while the cover can be laid out similar, as we shall show in another example in a future article.

Grand Rapids Sheet Metal Men Make Whoopee at Annual Dinner

Ike Lammers was elected president, last January, of the world famous Grand Rapids Sheet Metal and Heating Engineers. Ike has taken his job seriously and to keep up the pace set by his predecessors, he arranged a dinner party, which was a humdinger. The party took place quite recently in the dining room of the Association of Commerce, Grand Rapids. To make sure of the success of the affair, Ike invited such personages as Bill Sullivan, Bill Busch, John Bos, W. J. Stewart, Morris Ehle, Homer Brundage and several others. These gentlemen accompanied by their wives were all present and enjoyed a wonderful evening's entertainment.

A splendid dinner was served during which music was furnished by Schwartz's orchestra, and community singing was led by Frank Hodges. Henry Delnay entertained with a solo dance which also added to the pep and enthusiasm of the members. Following the dinner President Lammers introduced Bill Busch the speaker of the evening. Bill, in his usual capable manner, gave an interesting talk on the value of just such gatherings as he was then enjoying. Bill Sullivan next outlined the activity of the Michigan Standard Promotion Committee and gave a forecast of the future possibilities of M. S. Products.

He concluded by expressing his appreciation of being one of the guests at the meeting.

Mr. Jack Byrne, manager of the Grand Rapids Airport, next gave an intensely interesting talk on the future possibilities of aviation and explained the problems of present day commercial aviation. Mr. Byrne's talk was very much appreciated.

To keep the evening from becoming too serious, Bert Hogan, General Contractor and Entertainer Deluxe, told of his many experiences with "Jake" and "Teenie," two Hollanders living in Grand Rapids. Having heard Bill Sullivan introduced, Bert could not resist the temptation to tell a few good Irish stories. Anyway, Bert kept the crowd laughing for a good half hour. Dancing was next in order and after some time the evening was concluded a wonderful success. Good work, Ike, let's have more like it.

Don't forget to make your reservations at Lord Baltimore Hotel, Baltimore, for the convention.

Accessories Bring Greater Sales Possibilities to Warm Air Heating Industry

Automatic Regulation of Heaters Relieves Home Owner of Drudgery and Reduces Expense of Operation Hence It Has Big Sales Potentialities

DEMANDS in the warm air furnace field have changed radically during the last five years. This has been due to the introduction and increasing use of two new fuels—oil and gas.

Because of their nature, both of these fuels demanded some form of automatic regulation before their use could become practical in domestic heating. But in this connection the most serviceable form of automatic regulation was found to be thermostatic control. Thermostats in various forms were, therefore, adopted on gas and oil-burning units. This solved their problem, but besides solving the problem of fuel control, thermostatic control opened a wider field to gas and oil-burning furnaces. It gave them the additional feature of automatic control to sell to the consumer. Thus a new demand was thrust into the warm air heating field.

Automatic Regulation Increases Demand

How this demand has grown within the last five years can be shown by a few figures taken from a fuel survey recently made by the Midwest Coal Retailer.

"Recent surveys of the fuel situation in the United States show that competitive fuels have taken a great deal of the business that formerly belonged to coal. To displace fuel, oil and gas, 139,000,000 tons of coal would be needed annually. Some 368,000,000 barrels of fuel oil are still used. This displaced 86,000,000 tons of coal. Enough oil is imported to displace 10,000,000 tons of coal.

"Natural gas takes the equivalent of around 43,000,000 tons of coal. About a trillion cubic feet of natural gas is used annually. How much coal manufactured gas displaces is not known.

"About 700,000 domestic oil burners have been installed in the United States, it is claimed. This means an inroad into the coal business of [illegible] shows 0,000,000 tons of domestic coal annually, as E. C. Mahan, president of the National Coal Association, points out.

"In 1927 it was estimated that 38,000 commercial burners were sold to hotels, apartment houses, office buildings and industrial plants. How much coal this displaced it would be difficult to estimate.

"The oil burner industry has in a short time grown to a business of more than $95,000,000 in annual sales."

The two main elements which account for this enormous growth in oil burner industries are specialty selling methods of dealers and the emphasis placed on the automatic phase of operation, and of these two elements the largest is possibly automatic control.

The demand for automatic control in the furnace trade has grown by leaps and bounds in the past few years. In a recent study made by the Plumbing and Heating Industries Bureau, Philadelphia, the following facts were brought up by a city-wide survey:

Consumer Ever Seeking Greater Convenience

When 1,000 consumers—one consumer home out of every ten in a district was visited to secure the best possible cross sections of opinion—were asked what circumstances in buying a furnace led to a desire for new furnaces or equipment, they replied as follows:

	Percent
Convenience	91.7
Comfort	43.3
Other reasons	13.3

This bears out the statement made in preceding paragraphs to the effect that the major consideration today in the minds of purchasers is automatic control—in other words, comfort and convenience, not durability of materials or any of the reasons which were considered important by the generation now past.

A reason for this changed attitude may be found in the answers to the next question. Of the 1,000 consumers questioned, 66.8 per cent said that they had had no previous plumbing or heating experience as against only 33.2 per cent who claimed that they had. Of this latter number, many confessed that such experiences were slight. Can a furnace dealer reasonably expect these consumers to appreciate or be interested in technical detail?

Here is another table tending to further confirm the foregoing evidence. When asked what principal reasons they had for wanting new equipment, if such was desired, the replies were as follows:

	Per cent
Better results	66.7
Decreased cost of operation	5.6
Cleanliness	27.7
Modernization	11.1
Unavoidable need	...
Other reasons	22.2

In other words, two-thirds of this number wanted "better results" and more than one-third "modernization" and "cleanliness."

That was the reference to heating. Let us turn to the replies of this same group in reference to plumbing.

	Per cent
Appearance	4.5
Modernization	45.5
Health	9.1
Convenience or less work	72.7
Increased sales and rental value	9.1
Unavoidable need	9.1
Other reasons	13.6

Again the same basic conclusions

were overwhelmingly supported: *The public wants comfort and convenience and less work.*

This is exactly why the specialty selling of oil and gas furnace salesmen hits home. They place especial emphasis upon these points; in fact, their entire sales and advertising campaigns are based upon them—and they sell!

The reasons for this become clear when the factor of potential markets is examined.

Survey Shows Need for Greater Sales Activity.

The 1,000 consumers questioned were also asked why they had made no recent changes in furnaces or equipment. They replied:

	Per cent
Need just developed.....	10.8
Other needs given preference.	27.0
Lack of funds.....	27.0
Waiting for more convenient time	10.8
Fear of mess.....	None
Hope of lower price.....	None
Sheer neglect	8.1
Other reasons	24.3

And, further, what condition equipment was in when finally replaced. They answered:

	Per cent
Unsightly	1.2
Worn out	74.2
Good condition but old style..	21.5
Inadequate	4.7

This shows quite conclusively the need for better and more systematic exploitation of the vast potential market for coal-burning furnaces.

If 27 per cent of this thousand gave "other needs" preference, it indicates clearly that the actual need for up-to-date furnaces had not been sold to them clearly and emphatically. Other and perhaps more merchandised needs had been allowed to crowd the true need for furnaces into the background.

Twenty-seven per cent more said lack of funds. It is safe to say that these same consumers do not lack funds to spend on merchandise like automobiles, cosmetics and other well advertised and merchandised necessities. Does this not seem to indicate the necessity for a more intensive campaign to impress the public with the necessity of good furnace installation and a modern merchandising system to obviate the "lack of funds" objection?

Price Not a Primary Consideration

Ten per cent more were waiting for a more convenient time—in other words, they were waiting to have memory jogged; and still another ten per cent stated that "the need had just developed." Eight per cent more said "sheer neglect."

It is significant to note that none said "hope of lower price" or "fear of mess." In other words, not one of the thousand stated that they were dissatisfied with existing prices or were withholding purchase due to fear of inconvenience during installation. In effect, they were stating that they were waiting for some new reason to set them to thinking of furnaces again.

To sum up and give the net of the figures just quoted: Consumers are not buying coal-fired furnaces because they have not been sufficiently sold!

How can warm air furnace manufacturers and dealers sell this public?

By using the same or better merchandising methods than those used by oil and gas! How can that be done?

By selling better heating and convenience through the use of accessories.

What are they? They are automatic control of room temperatures, fuel economy, humidity, and in warm air heating controlled movement of heated air.

Automatic temperature regulation can be attained through thermostatic control of coal-burning furnaces and is exactly the same equipment as that featured by oil and gas-burning furnaces.

This system, it is believed, was first developed and perfected by the Minneapolis Heat Regulator Company, and parallel equipment was developed by Honeywell Heating Specialties Company. Each worked along somewhat different lines, but the equipment developed filled a very definite need.

Automatic regulation of the heating plant provides a uniformity of temperature otherwise unobtainable. A thermostat, extremely sensitive to temperature changes and electrically connected to a small motor in the basement, is located on the living room wall. It records the house temperature.

Limiting Devices Also Doing Good Work

If there occurs a change of one degree from the desired temperature (that is, the point at which the thermostat is set) it instantly starts the motor in the basement, which opens the draft if more heat is required, or closes it when the house is sufficiently warm. The thermostat may be equipped with a clock which automatically closes the draft at the retiring time at night and opens it in time for the house to be warm when you get up in the morning.

And a limiting device which is installed in the heating plant acts in dual control with the thermostat. It controls the heater temperature and checks the fire if for any reason an excessive heater temperature develops. Either the limiting device or the thermostat can check the fire independently of each other, but both must be calling for heat before the draft will open.

Aside from putting on coal and emptying the ashes, one can forget the fire entirely with automatic regulation. This is particularly valuable during the mild weather of early fall and late spring, when temperature changes are so frequent and the fire so difficult to regulate.

Although a plain type of thermostat is used to some extent, the clock thermostat presents advantages which cannot be overlooked. It provides for a lowered temperature of the house during the night.

This results in increased comfort, but the big feature is the increased fuel saving, which, according to actual tests, shows that the clock feature soon pays for itself.

The motor for damper operation may be either full electric or spring wound. The damper arms are connected to the dampers by means of

chains and pulleys and opens or closes these at the command of the thermostat. Cost of electric current is negligible.

The use of a limiting device on air temperature in dual control with the room thermostat is strongly recommended. It is a safety device as wel as a fuel saver. When the room thermostat calls for heat, the damper is opened and heat supplied.

This takes care of the phase of automatic control of room temperatures. Automatic control of the fuel supply for coal burning furnaces has practically found its solution in the automatic stoker. In addition to these devices there are various other devices on the market for the control of humidity, movement of air, etc. Therefore, it is not only possible for the furnace manufacturer to equip his furnaces with automatic control for coal burning units, but it is also possible through the aid of these accessories for the dealer to give his customer not only the feature of automatic control, but the features of greater comfort, convenience and health as secured through the accessories just mentioned.

Thus, it is possible for all types of warm air furnaces, whether coal-fired or oil or gas-burning, cast or steel, to present the modern appeal of comfort, convenience and health to their customers.

Printing Contract for Production of Trade Development Book Is Signed

Engravings to Be Made in Pittsburgh—To Have "Page Proofs" at Baltimore Convention

THE Trade Development Committee of the National Association of Sheet Metal Contractors wishes to announce that it has let the contract for the printing of the Trade Development Book to the Excelsior Printing Company, Chicago, and that it is practically certain to be able to show "page proofs" on a portion of the work at the Baltimore convention next month.

George Harms, Chairman of the Trade Development Committee, and W. C. Markle, Secretary of the National Association of Sheet Metal Contractors, were in Chicago for several days this week and, together with President Paul L. Biersach, signed the printing contract for the book and made final arrangements for the printer to proceed with the work.

The Excelsior Printing Company is a very large and responsible house, and the contract which the Trade Development Committee was able to consummate with them is very favorable to the association. Production of the book, therefore, under the most favorable circumstances is assured. The making of the engravings will be done in Pittsburgh.

Mr. Markle stated that the book will have a total of some 800 pages, 500 of which will be illustrations and the remainder explanatory text. None but the members of the Trade Development Committee and officers of the Association who have had the job of compiling this book can appreciate the stupendous amount of work an undertaking of this character engenders. To prepare some 800 pages of text, drawings and illustrations and to render the whole of a nature to be useful to architects requires very careful thought, and progress to the onlooker is seemingly exceedingly slow. The end, however, is now in sight, and the boys on the sidelines should not stint in their effort to give the members of the Trade Development Committee a "big hand."

Baltimore Copper Mills Move Chicago Branch Office and Warehouse

The Baltimore Copper Mills, Division of the Republic Brass Corporation, Baltimore, Maryland, has moved its Chicago office and warehouse to 3649 South Racine Avenue, Chicago, where it will share quarters with the Rome Brass & Copper Company,

For some time it has been apparent to officials of the company that they were working under a handicap in trying to serve the large area covered through the medium of stocks maintained in a public warehouse, located some distance from the office.

For the benefit of customers of the company who may wish to order by telephone, the number is Yards 6860.

W. R. Haines, Ames, Iowa, Seeking Larger Opportunity in Sheet Metal Industry

W. R. Haines, manager of the Ames Furnace & Tin Shop, 618 Twelfth Street, Ames, Iowa, who is also instructor in sheet metal work at the Iowa State Agricultural College, Ames, Iowa, is giving up his shop and is resigning his position at the college the early part of June.

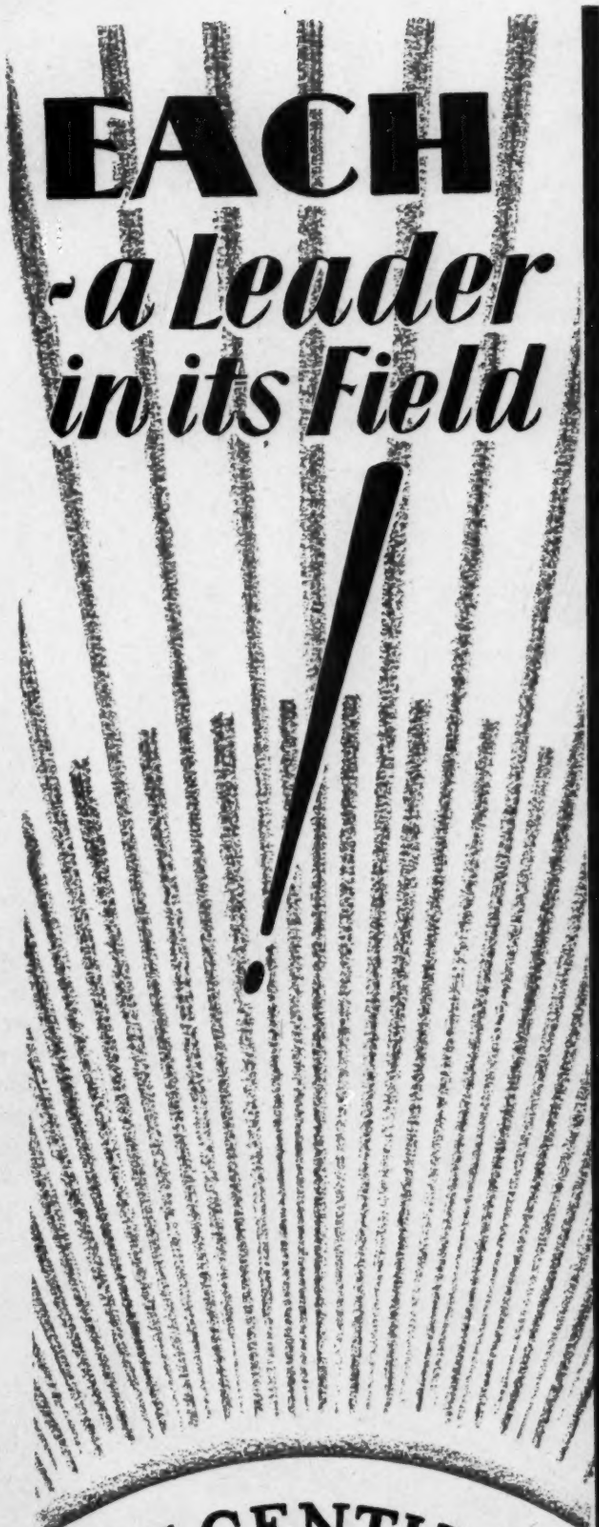
It is Mr. Haines' desire to locate as manager of a large shop, preferably in the south or west, or as superintendent of a fittings factory.

Mr. Haines has had wide experience in the sheet metal and warm air heating industry and his connection with the Iowa State Agricultural College has given him additional experience that would make him an extremely valuable man for some operator of a large sheet metal shop or factory superintendent of a manufacturing plant.

Charles R. Robinson Becomes Inland Steel Company Director

Charles R. Robinson, Vice President of the Inland Steel Company, Chicago, was elected a director of the company at a meeting of the Board of Directors this week to succeed Samuel Deutsch, who died recently. The retiring officers and the remaining members of the Board of Directors were all re-elected at the same meeting.

Additional vice presidents elected were, J. L. Block, A. C. Roeth and Frank R. Meyer, Jr.



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XXth Century Dealers have one of the most complete lines to sell. There's a XXth Century Heating Unit for every purpose at rock-bottom competitive prices.

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XXth Century Hot Blast Cast Furnace.
Standard of Fine Furnace value for 35 years.

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Popular priced sellers that appeal strongly to contractors and real estate men.

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A tried and proven product of long standing reputation.

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Excellent heaters for all the year or in-between seasons.

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Widely used for heating stores and small buildings.

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An important improvement in scientific heating licensed for use only by XXth Century Dealers.

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The XXth Century Heating & Ventilating Company offers a wide range of accessories and parts, including—

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Please give me complete information and prices on item numbers .....

For complete dealer proposition check here.

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Entertainment A-Plenty Being Planned for Baltimore Sheet Metal Convention

Sheet Metal Contractors from All Parts of Country Planning to Attend

ON JUNE 3, 1929, in the Lord Baltimore Hotel, Baltimore, Maryland, the National Association of Sheet Metal Contractors will assemble for the twenty-fifth consecutive annual meeting. This meeting will mark a quarter century of service of the association to the sheet metal industry.

The Baltimore local Sheet Metal Contractors' Association has been looking forward for several years toward entertaining the convention in Baltimore on the association's twenty-fifth anniversary. One of the reasons for their desire in that direction is that one of their fellow members is a charter member of the association and has been active in work during the entire time. That man now has the honor of being the Chairman of the Convention Committee, and his name is W. A. Fingles, Sr.

These Baltimore men and women in the sheet metal fraternity, in making plans for the June convention, are taking full advantage of the many wonderful attractions which that section of the country has to offer to induce sheet metal men and their wives to make the trip to Baltimore. In arranging their program they are giving ample opportunity for sight-seeing trips without interfering with the convention's sessions.

There are hundreds of good reasons why sheet metal contractors from all parts of the country should attend this convention, but in order that you will have the affair thoroughly in mind, I am going to give the Baltimore men themselves an opportunity to tell you why you should come to this convention and show you their earnest desire to entertain you.

Charles E. Brandt, of Charles T. Brandt, 1220 Ridgely Street, Baltimore, urges you to come for the following reasons:

"I would say that this convention should, without doubt, be the most successful national convention ever held.

"My reasons for making the above rather broad statement are, first and foremost, that W. A. Fingles, Sr., our convention chairman, who was a national officer for a number of years and who has attended every convention but one since its organization, is the chairman of the convention committee. Mr. Fingles, who is well qualified as a chairman, is devoting his full time to making this convention a success. He has planned to do more than has ever been attempted at any previous convention, and these plans are being carried out with every indication of success.

"I might also add that this is the twenty-fifth or Silver Anniversary Convention. The number of historical points of interest to be seen in Baltimore are additional reasons for attending this convention. Let us hope we may have the pleasure of seeing you all in June."

W. A. Fingles, Jr., 29 South Howard Street, Baltimore, perhaps has more inside information on what is going to happen during the Baltimore convention than anyone else, being in close contact with his father, the General Convention Chairman, and makes the following comment:

"There are many reasons why every sheet metal and roofing contractor that can possibly do so should attend the Baltimore convention.

"At these meetings, competitors usually learn that they are friends and not enemies, as some seem to believe. Different ideas are exchanged for the benefit of those present, which in most cases more than compensate for the time and expense of attending.

"The local convention committee is working very hard to make the program attractive, as Baltimore is ideally situated from many standpoints. We will guarantee a pleasant time for everyone who attends."

John O. White, head of the John O. White Company, Garrison Lane and the Pennsylvania Railroad, Baltimore, invites everyone down in the following words:

"Why sheet metal men should attend the national meeting in Baltimore in June. It so happens I have been a member of the Rotary Club of Baltimore for the past fifteen years, and we have a code of ethics for business men of all lines, and our fifth principle seems to answer your question and will be recognized by a great number of our National members who without a doubt are also members of Rotary. I therefore take the liberty of quoting:

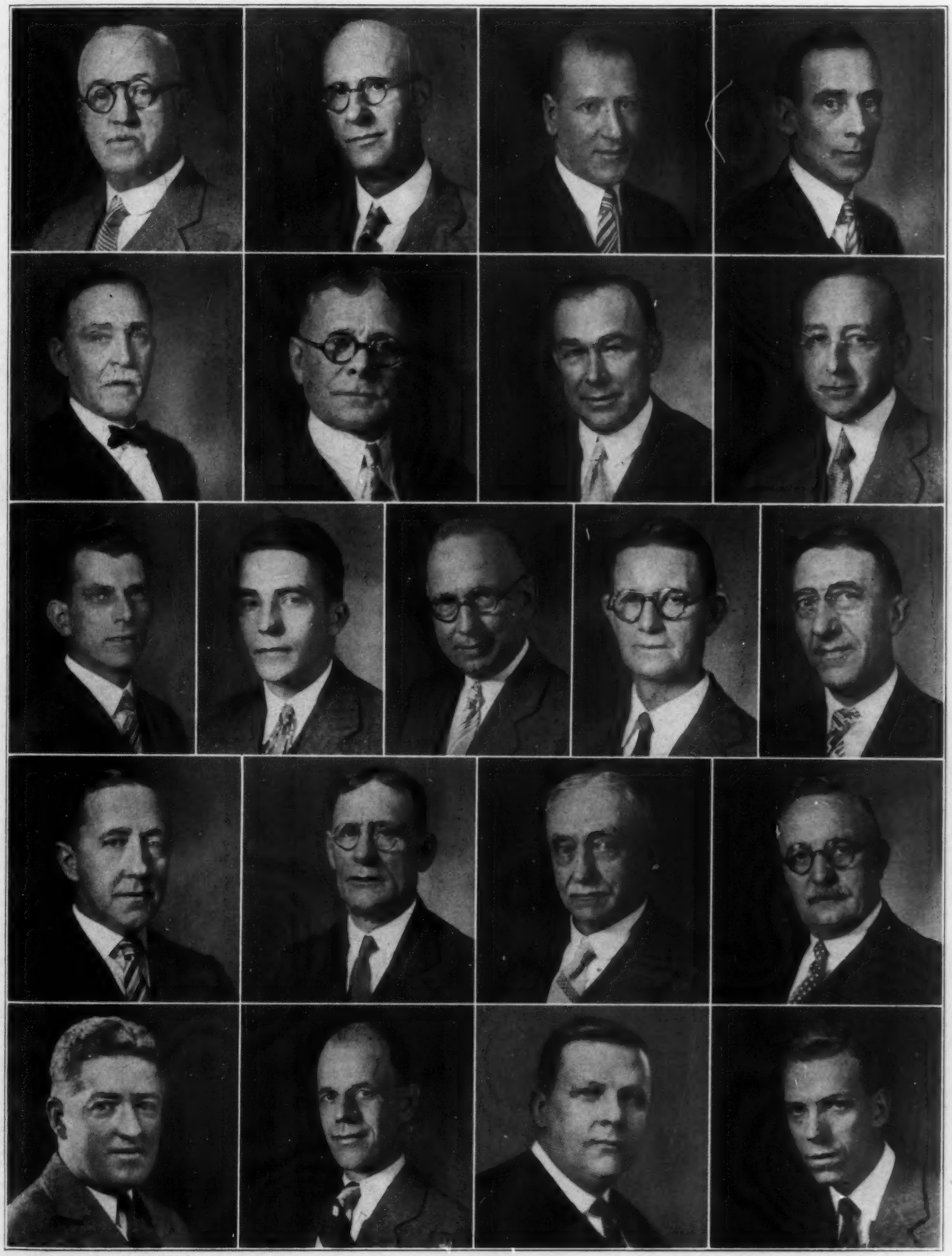
" 'To use my best endeavors to elevate the standards of the vocation in which I am engaged, and so to conduct my affairs that others in my vocation may find it wise, profitable and conducive to happiness to emulate my example.'

"To put this into practice we must also know our fellow member by contact with him, and one way to gain this contact is to attend the National meetings."

Fred W. Ludwig, of John G. Hetzell & Son, northeast corner Paca and Mulberry Streets, Baltimore, urges you to attend the convention as follows:

"The reason that we think that all sheet metal men should attend this convention is that when we all get together we get ideas that are a benefit to us and make us feel as though we are of one family.

(*Continued on Page* 24)



Reading From Left to Right and Down—William A. Fingles, General Chairman; Philip H. Landerking, President Baltimore Association, Chairman of Entertainment Committee, E. J. Ward, Treasurer Baltimore Association, Chairman of Ladies' Entertainment Committee; John J. Cotton, Chairman of the Transportation Committee. Second Row from Top, Left to Right—William F. Zeller; William E. Cotton, Max A. Seiler; Joseph L. Haggert. Third Row—J. B. Hiss, Secretary, Baltimore Sheet Metal Contractors; Charles E. Brandt; John E. La Motte; Samuel O. Bevans; William G. Blandford. Fourth Row—Harry C. Guenther; Fred H. Ludwig; Charles T. Brandt; George Trautner. Fifth Row—William A. Fingles, Jr.; William Hering, Chairman, Program Committee; Roy Danzer; Robert N. Francis, Assistant Secretary, Sheet Metal and Roofing Contractors of Baltimore

Fans on Gravity Furnace Systems—An Analysis of the Data Pertaining to Fans

Given at the Research Session of the Indianapolis Meeting National Warm Air Heating Association

THE REPORT of the research work of the Warm Air Heating Association which was shown at the 1929 annual meeting in Indianapolis should be of great interest to the industry and merits some analysis.

The first point of interest shown was: If the fan arrangement did not produce more air than the gravity flow, such a fan was less efficient than gravity flow.

It should be kept in mind that this test was made on a gravity system, designed, installed and operated by experts, and while the system tested shows a gravity air volume of 600 to 800 c.f.m., the same size building with a differently designed, installed or operated plant may show an air volume considerably less. Although the fan used was a 16-inch 6-blade wheel of the ordinary desk service type, obviously not designed for this particular service, it could, however, easily deliver an air volume in excess of a gravity flow, and the report showed quite conclusively that the efficiency was increased in direct proportion to the increased air flow.

Another point of interest was that the booster arrangement had some advantages up to a certain point. That is to say, the booster fan supplied an increased air volume at a low combustion rate of firing, or to put it another way, when the fire was low and air temperature was low, there was, of course, a very small motive head and necessarily a small amount of gravity air flow. During this period it was shown that the booster fan increased the air flow. There came a time, however, when the combustion rate was increased and the temperature raised so that the gravity flow exceeded the fan volume rendering the fan unserviceable.

Analyzing these results, we must conclude that in view of the fact that increased air flow invariably increases the efficiency, the booster fan did improve this comparatively perfect gravity system.

Pressure Tests

The pressure tests set up quite a different condition. Notwithstanding the fact that the set up was strictly a gravity arrangement, without regard for what a forced air system should be, the pressure tests were made simply by attaching a pressure fan to an already installed Standard Code gravity system. In other words, these tests—comparative tests, incidentally—were made between the best possible gravity system and the worst possible fan system; it is significant to note that notwithstanding the fan system's handicap, the results showed a material increase in efficiency. One curve showed an increase of 50 per cent in heat delivered at the bonnet from the same amount of fuel.

In analyzing these results we must conclude that such increase in efficiency and heat delivery has decided advantages and merits further investigation. It is obvious that a system designed with some regard to forced air circulation would show still more improvement.

Due to lack of technical knowledge in the furnace industry, some confusion may come out of this report.

The question was asked of the laboratory: "Will a fan increase the 'over-all efficiency' of a good gravity warm air system?"

The experiments were made, and the answer was "No."

We must bear in mind that "over-all efficiency" is reckoned by the loss of heat through the outlet of the chimney top.

This question and answer is decidedly confusing because "over-all efficiency" is, in reality, the least important point of efficiency. If "over-all efficiency" were the important question, we could eliminate the heating industry entirely and obtain 100 per cent "over-all efficiency" by building our fire on the basement floor, thus eliminating chimney loss also.

If the questions had been asked:

1. Will a fan increase the bonnet efficiency of a good gravity system?
2. Will a fan increase the register efficiency of a good gravity system?
3. Will a fan increase the distribution of heat in a good gravity system?
4. Will a fan increase the heating capacity of a good gravity system?
5. Will a fan render available accumulated heat in the furnace of a good gravity system?
6. Will a fan reduce the heating-up period of a good gravity system?
7. Will a fan increase the air circulation of a good gravity system?
8. Will a fan reduce the register

In this article J. C. Miles, Vice-President of the Warm Air Furnace Fan Company, Cleveland, Ohio, calls attention to several factors in the research data given at the Indianapolis meeting of the National Warm Air Heating Association which he thinks might easily be subject to misunderstanding by furnace installers.

It is hoped that readers of AMERICAN ARTISAN *who were present at the Indianapolis meeting of the National Warm Air Heating Association will read over carefully what Mr. Miles has to say so that they will fully understand just what was meant.*

temperature of a good gravity system?

9. Will a fan raise the floor temperature of a good gravity system?

10. Is a fan justified on a good gravity system?

11. Would a fan be justified on a gravity system, handicapped by circulation?

12. Is a fan justified on a warm air furnace system having one or more basement pipes 12 feet long or longer?

13. Will a fan produce positive circulation when attached to a good gravity system?

The answer, if the right fan is used, is "Yes."

The results of these tests show quite conclusively that with the right fan to increase the circulation, distribution, impingement, etc., that the answer is "yes" to every question, except the one relating to "over-all efficiency." In view of the heat necessary to maintain chimney draft, is it possible or important to attain much increase in "over-all efficiency" beyond that shown in the gravity system? Or is it more important to strive for higher room comfort, higher floor temperature, lower ceiling temperature, or as Professor Willard pointed out, higher outside wall surface temperatures?

It was confusing to note that the fan system produced higher bonnet efficiency, higher register efficiency, and more heat from the coal burned, but no increase in the "over-all efficiency." The increased efficiency of the fan system was explained in part by the increased distribution, which seems logical.

A question was brought out at this meeting relative to the advisability of a combination system wherein a gravity capacity for 50 degrees temperature difference and a fan capacity for 70 degrees temperature difference is incorporated as the one system.

The discussion brought out these facts that some experimental work along these lines would probably throw a new light on the subject of home heating efficiency.

Warm Air Heating Institute Will Apply Resuscitative Measures to Industry in Chicago Area

Complete Success of Effort Will Require Cooperation from Manufacturers, Jobbers and Dealers

EFFORTS to resuscitate the warm air heating business in the Chicago area are now definitely under way with the establishment of the Warm Air Heating Institute, and the Chicago public is at last assured of receiving definite, impartial information regarding the superior merit of warm air heating.

In the April 6th issue of AMERICAN ARTISAN there appeared an article calling the attention of the warm air heating industry to the fact that serious inroads were being made on warm air heating by competitive types of heating. Stress was placed upon the need for some activity on the part of the warm air heating industry in the Chicago area to counteract the effect of this publicity.

This article, we are proud to say, has borne fruit by reason of the fact that it has awakened several warm air furnace manufacturers to the urgency of the need for educational publicity in the Chicago area, and these men have clubbed resources to furnish the finances necessary to engage in a program of education which will take the form of newspaper space, radio broadcasting, and informal talks. We are very happy to announce that a real start has been made in this effort and already the institute has been able to have published in the Chicago Tribune an article on the value of the warm air heating system not only as a heating unit but as a ventilating and air purifying unit as well.

A great deal of credit is due these men, who are all thoroughly responsible warm air heating engineers, for the start that they have made. But the undertaking in which they have engaged is a very large one and one that is going to require a great deal of financing, a full appreciation of which they all have. Therefore it is the hope that all warm air furnace manufacturers, jobbers and installers who market their products in the Chicago area will lend their support to the movement, as the ultimate success attained will depend upon the amount of money they will be able to command.

They deserve your support. Let them have it to the full. Communication with them can be had through the editor of AMERICAN ARTISAN, 139 North Clark Street, Chicago.

Ray Harms Will Represent Midland Furnace Co. in Northern Illinois

Ray Harms will travel Northern Illinois for the Midland Furnace Company, Columbus, Ohio. Ray is a practical man, having worked at the bench. He came from a family of sheet metal men and warm air furnace installers and knows the problems of installers, salesmen and dealers. He knows good merchandise and what must be done to get better merchandise in the hands of the trade. He will live in Peoria, Illinois, and travel the Northern Illinois territory.

S. H. Truitt, Philadelphia District Sales Manager, The Central Alloy Steel Corp.

The Central Alloy Steel Corporation has appointed S. H. Truitt as district sales manager of the Philadelphia district. He will succeed C. C. Willits, who resigned. Mr. Truitt formerly was assistant sales manager at Philadelphia and has been connected with the company for some years. He will be welcomed to the new territory with open arms.

P. H. MaGirl Foundry Has Catalog on Latest Developments

The P. H. MaGirl Foundry & Furnace Works, Bloomington, Illinois, makers of the Gibraltar furnace, have recently issued their new catalog No. 37 illustrating and describing the new Gibraltar warm air furnace.

Warm air furnace installers who are anxious to keep informed on improvements that are being made to the products which they market are sure to find some important developments described in this catalog. As not only warm air furnaces for residence work, but heaters for larger units are also described.

When writing ask for catalog No. 37 on the new Gibraltar furnace.

One Type Fan Hook-Up Where Installation Has Two Cold Airs

From D. R. Capes, President of the A. C. Manufacturing Company, Pontiac, Illinois, comes detailed information about the installation and sale of the A-C fan.

Mr. Capes also sent us a special drawing showing the hook-up recommended when the A-C booster is used on a two return cold air job. The accompanying illustration with alphabetical key explains this fully. The same practice is recommended on the three cold air return job.

BALTIMORE CONVENTION

(*Concluded from Page* 20)

"This will be the 25th national convention and we hope to make it one of the best ever had. It is the first one ever held in Baltimore and I think it has been some time since a meeting has been East. We are only about an hour's ride from Washington, and those that would like to take a trip there would find many places of interest; also in Alexandria, which is but a short distance from Washington.

"This convention will be held during the week that the cadets graduate at Annapolis, where we all expect to go by boat down the Chesapeake Bay, about one and a half hours' ride, with plenty to see going down. No one would regret this trip. Taken all in all, we assure you Baltimore will try to give all a good time; if not, we will be the ones to be disappointed."

Then there's E. John Ward, Wilbur F. Ward, 20 West Pratt Street, Baltimore, who would like to see you come to Baltimore during the National convention for the following reasons:

"Outside of the good that the meetings do them in their line of business, the Baltimore local is planning to entertain the delegates in a way that will be talked of as long as there is a National Association.

"Among the sights are the following: A boat trip through the harbor and down the head of the Chesapeake Bay to the Naval Academy. This alone is worth coming for, as the view and beauty is unsurpassed in the whole U. S. A. Visit to the Copper Refinery—the largest in the world. Fort McHenry will also be viewed from the boat. Druid Hill Park, one of the largest natural parks in the U. S.

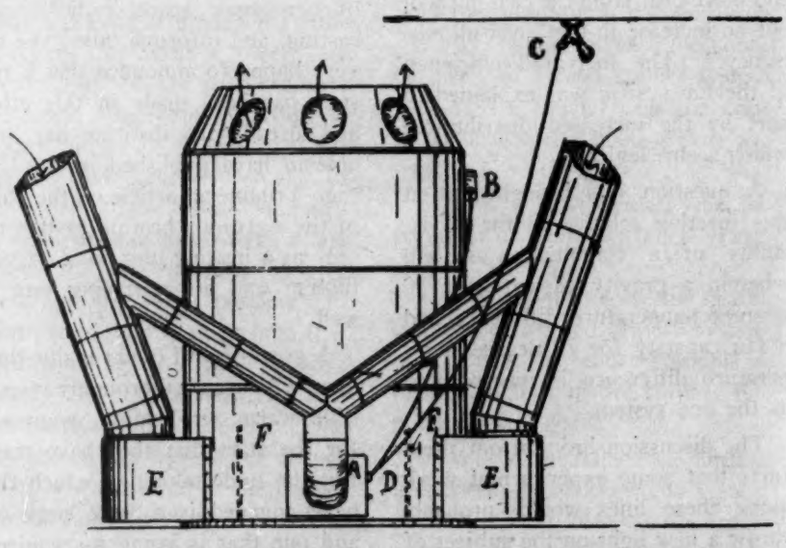
"These are only a few of the bits of entertainment our chairman, W. A. Fingles, and his committee are planning."

Roy Danzer of the Danzer Metal Works, Inc., West Lee Street, Hagerstown, Maryland, has the best welcome of all. After reading what he has to say no one could keep you home if he tried:

"It is a pleasure to welcome all sheet metal contractors to the annual convention of the National Association of Sheet Metal Contractors in Baltimore this year.

"The sheet metal trade, possibly more than other craft, needs a definite organization in order to combat conditions which have continued to grow worse over a period of the last ten years. This group is one of the few crafts that has not thoroughly organized for its own protection. This protection can be effected only through a central organization such as the National Association, and it is, therefore, quite essential that every sheet metal contractor should make it his particular business to affiliate with the organization and attend its conventions to derive the benefits therefrom."

Now that I've permitted some of these Baltimore boys to talk to you and tell you some of the wonderful things you are going to see and hear in Baltimore during the convention of the National Association of Sheet Metal Contractors, I am going to take the liberty of introducing them to you so that when you see them in June you will be able to walk up to them and say, "Howdy, Bill, and Ed, and Joe, and John, I'm glad I came."



Illustrating A-C Fan Connection on Two Cold Airs

THE NYE WAY

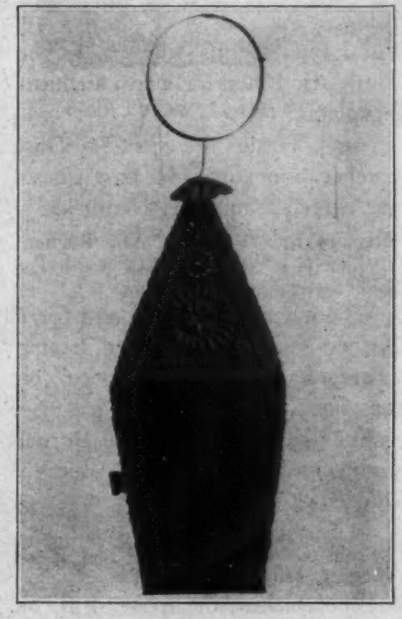
(*Continued from Page* 13)

You cannot run the back of the seamers over the first time and expect to make a success of it. Use the mallet to get the first turn-down so that the seam will fold true all the way along the edge. If the first turn is not folded right and true, there is where the trouble with leaks starts. Watch all folds of seams closely and when folding the second turn, mallet it down to an angle which will permit the seamer to close down. This is very particular on the second turn, because if it is not down to an angle of 45 degrees it is liable to slip and spoil your seam.

Do not regard a seam completed when you treadle the second fold. That seam is no more completed than the roof is completed without the paint on it. Here is where the old hand seamer comes in. Take the hand seamer, stand on edge with face on the opposite side of the fold and hold tight against the standing seam. With the mallet strike the fold of the seam up tight. This makes the seam water tight. It may sound curious to some of the readers, nevertheless this is the Nye way and it will save a lot of leaks. The steeper the roof, the more the tendency to leak in the seams will be. The seams must be tight. This tightening of the seams is one of the operations in the laying of a good sheet metal roof which a great many contractors pass up, which is a mistake. This tightening of the seams makes them stay put, and I emphasize "put." Cleats should be placed no more or less than 12 inches apart.

I want to state, in painting do not paint the back of the tin and let the edges go unpainted. This will cause the seams to rust out. Paint the 1¼-inch edge when painting the back of course. Then after cleating, paint the 1-inch edge just before putting the next course in place. I have seen many a roof rusted in the seams because no paint was used and the roof was ready to be done over in a short time. I mention these little things as I go along so as to give the reader the benefit of my observations during my years of experience in this kind of work.

The next operation is the placing of the headers at the front of the roof. For the front I cut the sheet 14x20 and trim the corners of these sheets so that they will fold and solder enough of them to go crosswise. I break this with valley tongs and turn one-half edge under and then it is "L" shaped. I put this down in lengths that handle easily, hook them to the standing seam roof and up against the back of the front and mallet them down tight across



Odd Shaped Sheet Metal Lantern

the head of the roof and solder it solid.

The standing seam is the next operation. The ends must be turned at 45-degree angles and folded the opposite way of the seams are on the roof to keep all of the water out. Then solder the seams good.

Then comes the operation on the back of the front of flat seaming the roof to the top of the front, permitting ½ inch to extend above the top of the flat part of the sheeting so that I could hook the flat seam sheets to them and with the hand seamer tighten the seams and then with the side of the mallet drive the seam down.

In laying flat seam roofs this must be done one sheet at a time. In some sections sheet metal workers solder in rolls and lay it in courses and all of the cross seams are not fastened down. This is what I call a botch job and one that will not stand. It takes about five pounds of solder to each square of roofing on the flat seam roof. Soak the seams well.

The illustration shows plainly the flashing, the writer standing in picture, to do a good job, should be measured so as to give each flashing the same pitch with the roof and should be made in the shop. Be sure to have the flashings painted on the back side and also that they are dry before applying them.

In the next operation take a piece of 20-gauge sheet iron and cut teeth in it like those of a saw to cut out the mortar, and if the mortar is hard, use a cold chisel first to break the outside.

Put the flashing in place, starting at the bottom of the roof, and have soldering furnace so you can solder the flashings in place to hold them until you can nail them. Use the old-fashioned cut nail. It will stay put in a brick wall. Then point up all flashing with portland cement and sand.

The next operation is the painting. Be sure to sweep the roof clean. Don't try to paint a roof with a lot of dirt and dust. Get this all off. In painting a roof be careful to get the under sides of the folds painted well and don't paint with too heavy paint, as this will cause peeling later on when the roof gets old. The condition of the weather makes a great difference as to how thin or how thick the paint should be applied.

The ends of seams. I have a pair of flat nosed pliers with the ends ground down to an angle of 45 degrees, and grip the ends of the standing seam with these. A triangle sticks out above the pliers and I strike this over with the hammer. Take the pliers off and tighten this with the hand seamer and hammer. Always fold these ends opposite from the way the seam is folded. They solder better when this is done.

The back of this front was sided up with lumber and I flat seamed

the rear one-half an inch above the top and blind nailed as close to the top as I could. Then with the one-half tongs I turned this one-half edge to a right angle and that made the edge to hook the flat seam of the top of front.

The reason that I did not put the standing seam against the wall is that it would make extra work soldering the raw edges of so many seams against the wall, and those raw edges are not as good as the way of putting in a header.

This explanation I hope will help to better the tin roofing business. Some of the trade might say that there is more time spent than is necessary on this way of mine. That is up to the boss of the shop, to do as he sees fit. I am giving my experience of 37 years, and if anyone wants to benefit from it, that much good has been done.

Small Booster Fan for Warm Air Pipe

From Carr Supply Company, 414 North Dearborn Street, Chicago.

Can you tell us who makes a small, inexpensive booster fan for a warm air pipe?

Ans.—Heating Systems Corporation, 307 Scott Street, Joliet, Illinois.

"Fosco" Ventilator

From Knetzer Brothers, Gillespie, Illinois.

Please advise us who makes the "Fosco" Ventilator.

Ans.—F. O. Schoedinger Company, Columbus, Ohio.

Fireplace Arrangement with Iron Walls

From The Emery-Waterhouse Company, Portland, Maine.

We should like to know the name of the firm that puts out a fireplace arrangement which has iron walls with air space between the iron and the brick, so that the warmed air, instead of going up the chimney, is lead back into the room to registered openings.

Ans.—This is known as the "Heatilator" and is made by The Heatilator Company, Syracuse, New York.

Metal Gliding Settee

From Louis I. Drackert, Tipton, Missouri.

Please tell me who makes a gliding settee in practically all steel construction with the slats on seats and backs out of wood.

Ans.—St. Charles Net and Tennis Company, St. Charles, Illinois; Troy Sunshade Company, Troy, Ohio, and W. H. Howell Company, Geneva, Illinois.

"Tuttle" Air Filter

From the XXth Century H. & V. Co., 633 South Delaware Street, Indianapolis, Indiana.

Can you tell us who makes the Tuttle Air Filter for warm air heating plants?

Ans.—Tuttle Register Dust Catcher Company, 144 East Chestnut Street, Louisville, Kentucky.

Repairs for "Paragon" Oil Burner

From Jack Stowell, 12-14 South LaSalle Street, Aurora, Illinois.

Where can I secure repairs for a Burner No. 2 Gravity Feed, having "Paragon Oil Burner Service" on the plate?

Ans.—Refer to Atlas Oil Burner Company, 5812 Broadway, Chicago, Illinois.

Post Drill

From C. C. Bruscke & Son, Good Thunder, Minnesota.

Who makes the post drill on which the main frame is C2, the fly wheel C22 and the table C26?

Ans.—Canedy Ott Manufacturing Company, Chicago Heights, Illinois.

Address of American Ventilating Company

From Knetzer Brothers, Gillespie, Illinois.

Can you tell us where the American Ventilating Company is located?

Ans.—204 Keystone Bank Building, Pittsburgh, Pennsylvania.

Furnace Vacuum Cleaners

From R. J. Boslough, 2007 Noyes Street, Evanston, Illinois.

Please inform me who makes furnace vacuum cleaners.

Ans.—National Super Service Company, 812 LaFayette, Toledo, Ohio; Brillion Furnace Company, Brillion, Wisconsin; Gottschalk Heating Company, Covington, Kentucky.

"Ruby" Soldering Acid

From Fisher Brothers Company, Cazenovia, Wisconsin.

Will you kindly advise us who makes "Ruby" soldering acid?

Ans.—Ruby Chemical Company, Columbus, Ohio.

Perforated Metal

From City Tin Shop, Rear 213 E. Center Street, Warsaw, Indiana.

Where can I buy metal 12 by 12 inches, perforated with ¼ inch round holes, also some perforated with ⅛ inch round holes?

Ans.—Harrington and King Perforating Company, 5655 Fillmore Avenue, Chicago, Illinois, and Nortmann-Duffke Company, 1240 27th Avenue, Milwaukee, Wisconsin.

Address of Bishop-Babcock-Becker Company

From J. F. Cleary, Gidden, Iowa.

Can you tell me where the Bishop-Babcock-Becker Company is located? My letters addressed to them to 219 West Washington Street, Chicago, were returned unclaimed.

Ans.—This firm is now known as The Bishop and Babcock Sales Company and is located at 112 West Austin Avenue, Chicago.

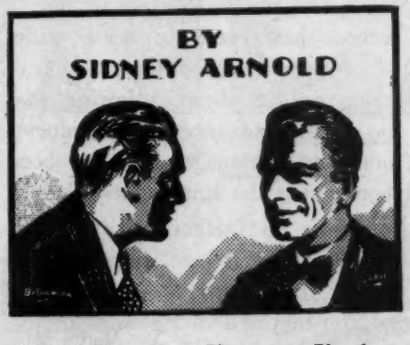
VENTILATION AND HUMIDITY

(*Concluded from Page* 11)

naturally becomes drowsy and sleepy, and in this modern day where deep thinking and an alert brain is necessary, you will find that this condition only exists where pure fresh air is not in motion, properly conditioned. It is possible to humidify as much as 15 gallons of water in 24 hours in the modern forced air system. This fact alone should be a big consideration in choosing a heating plant, as it not only aids in keeping one's health, but the saving of high-class woodwork, furniture and rugs in itself is an item that the average person does not consider.

The prediction of the writer is that within the next ten years the development in warm air heating, with the advantages as above mentioned, will be almost exclusively used as a manner of high-class home heating. We've got the system. Let's get out and sell it.

RANDOM NOTES AND SKETCHES



I had a very distinguished visitor on Wednesday of this week; in fact, he was the second visitor caller I had in our new location at 139 North Clark Street. I said distinguished because he is just that, and he was W. C. Markle, Secretary, and for two terms President of the National Association of Sheet Metal Contractors. Mr. Markle was in Chicago on business in connection with the printing of the Trade Development Book and stopped in for a brief chat. I appreciated this honor paid me very much indeed.

* * *

There were two other visitors in this week, one of which, John J. Muryn, Milwaukee, Wisconsin, has the distinction of being the first man to visit us in our new location. The other man was P. N. Patterson, Manager of the Warm Air Heating Institute, Chicago. Mr. Patterson is going to give a good account of himself in the warm air heating industry in Chicago in the very near future. Keep your radio in good working order.

* * *

John F. Cartwright, Bowling Green, Kentucky, got on a trolley car and, finding that he had no change, handed the conductor a $10 bill. "I'm sorry," he said, "but I haven't a nickel."

"Don't worry, Sir," said the conductor, "you'll have just 199 of 'em in a minute."

* * *

An Understandable Error

W. A. Fingles, Baltimore, on the golf course: Just look at that girl dressed like a man. What are her parents thinking of, anyway? I think it's disgraceful.

Golf Partner: That, sir, is my daughter.

Mr. Fingles: I beg your pardon. I didn't know you were her father.

Golf Partner: I'm not. I'm her mother.

* * *

The following joke may be comedy for some sheet metal men, but it may be a tragedy for others.

A Colored Bootlegger (three jumps ahead of the officers): "Gimme a ticket on de speediest train whut runs. I craves distance and needunt mind where to."

Ticket Agent: "But the fast train has just gone."

C. B.: "Ne' mind. Jest show me de track what it lef' on."

* * *

C. C. Tolg, Waukesha, Wisconsin, sheet metal contractor, says that he has figured out that the yellow lights on traffic signals are to warn the Scotch drivers to start their motors.

* * *

J. I. Thomas of Lewistown, Pa., tells us that the AMERICAN ARTISAN comes to him as regular as his meals and he reads it as regularly as he eats his meals.

* * *

The following is directed to Bill Laffin of the Chas. Johnson Company, Peoria, who will laugh immensely:

It is a preserved extract from a love letter written home to his wife by a soldier on active service and will evoke tender memories in thousands of former service men:

"Don't send me no more nagging letters, Lettie. They don't do no good. I'm three thousand miles away from home and I want to enjoy this war in peace."

* * *

"What did you put in this prescription?"

"That I can tell only to the doctor," said the druggist.

"The doctor wants to know. Seems I gave you a Chinese laundry ticket and you filled that."

* * *

Tom Quinn, an officer of the Pennsylvania Sheet Metal Distributors Auxiliary, said at a recent banquet:

"A toastmaster's speech should be like a flapper's skirt—short enough to be interesting and long enough to cover the subject."

* * *

Plain Logic

First Darkey: "What fo' you name yo' baby 'Electricity,' Mose?"

Second Darkey: "Well, mah name am Mose, an' mah wife's name am Dinah, an' if Dinahmose don't make electricity, what does dey make?"

* * *

Roy Harrison, Illinois sales representative of the Rudy Furnace Company, had been talking to his wife the night before about buying a new spare time for his car. The next day his little daughter came home after seeing a lady with triplets and said to her mother, "Mama, I bet you can't guess what I saw on the street today." Mrs. Harrison, all interested, wondered what was coming next, asked, "No, what did you see?" And the little girl answered, "I saw a lady with twins and a spare."

Interest in Third Quarter Pig Iron Making Itself Manifest in Several Districts

Talk of Using Substitutes for Copper Has Disappeared Since Price Decline

PIG iron production during March increased 16% over last year and Steel Ingot production made a gain of 12%.

Structural steel bookings have been showing increases each month over the corresponding months of the previous year and unfilled tonnage at the close of March was well over the month before and 2% greater than at the close of March, 1928.

Sheet steel shipments during January were 32% over a year ago and during February were 9% above a year ago. It is difficult to make comparisons as such activity as has been witnessed during the opening of 1929 has never before been closely approached.

The non-ferrous metals have moved along with steel and iron, with copper leading the new activity.

Copper production from domestic mines during March was 33% larger than for March of last year; copper refinery output was 27% larger; and copper shipments were 29% larger.

Tin consumption during January gained 62% over the previous January and in February gained 17%.

Zinc production was down 1% in March from the total of a year ago but shipments were up 4% and stocks declined 9%.

The demand for lead has improved but February production was only 48 thousand tons, a drop of 13% from February of last year, and a still greater drop from January of this year.

Interest in third quarter pig iron buying is beginning to manifest itself in several districts, says the market report of Rogers Brown & Crocker Brothers, Incorporated, New York, but principally around Chicago.

In the territory where price advances have recently been made, buyers are more indifferent to covering so far ahead, believing that no further advances are imminent, and little tonnage has yet been bought for the summer months.

While no further price changes are recorded, recent advances are firmly maintained. The high rate of consumption continues, fully absorbing the present heavy production.

Copper

Most of the talk heard in the copper trade about the use of substitutes for copper has disappeared since the price has declined to 18 cents, delivered Connecticut.

Various classes of users have expressed themselves as favoring the continued use of the red metal in production where it has been established rather than resorting to other materials.

The present situation does not mean that competition between metals is at an end but rather that it is nearer the basis which prevailed prior to the high copper prices that have prevailed in the past few months.

Swings in demand from one metal to another now are more likely to be strictly on an engineering basis for reasons aside from price, although of course market cost always will be a factor to be reckoned with.

Brass and copper plumbing goods, it is believed in the trade, will continue in production at a high rate with copper at the 18-cent level.

Quotations on electrolytic are firm at 18 cents, delivered Connecticut, 18.12½ cents Middle West, and 17.90 cents refinery. Casting copper is quoted 17.62½ cents and lake copper commands 18 cents to 18.12½ cents.

Lead

The lead market is quiet and prices are slightly easy from the levels prevailing at the close of last week. Lead is quoted 6.80 cents to 6.82½ cents, East St. Louis.

More buying for May shipment is expected, but orders at present are lagging.

The heavy metal was quoted 6.80 cents to 6.85 cents, East St. Louis, at the close of last week's trading.

Tin

The tin market is weak with Straits metal quoted 44 cents to 44.12½ cents on spot and futures. Ninety-nine per cent tin is held at 43.25 cents to 43.37½ cents.

Consumers in the market are waiting to see how low quotations will go before they place orders.

The market opened with Straits metal quoted 44.25 cents to 44.37 cents on spot and futures. Later prices declined as trading progressed.

Zinc

Zinc quotations hold unchanged and steady, with perhaps a slightly firmer undertone in evidence. Most of the metal offered at 6.50 cents, East St. Louis, has been absorbed and most smelters now are asking 6.80 cents, East St. Louis.

Quotations on prime western zinc are 6.50 cents to 6.60 cents, East St. Louis.

High grade zinc is held at 8.25 cents, prompt delivered, and brass special is quoted 6.60 cents to 6.70 cents, East St. Louis.

Zinc prices were stronger in London today. Spot zinc was quoted £26 15s, an advance of 5s from last week's close, and futures £26 10s, a gain of 1s 3d.

Solder

Bar solder, warranted 50-50, per 100 lbs., $31.25; 48-52, per 100 lbs., $30.50; 45-55, per 100 lbs., $29.25; plumbers', per 100 lbs., $27.25.

Sheets of TONCAN Iron resist rust and corrosion

TONCAN Copper Mo-lyb-den-um iron is pure iron—scientifically alloyed with pure copper and molybdenum to produce an alloy—more resistant to rust and corrosion—more enduring under adverse circumstances than any other ferrous metal known to the industry.

For sheet metal work of all kinds Toncan can not be improved on. No other iron fights decay and deterioration so successfully. And it has hundreds of uses. For roofing, ventilating systems, smoke stacks, cornices, metal lath, boilers, stoves, pipes, gutters, etc. Wherever there is need for sheet metal there is need for Toncan—and wherever Toncan is used permanence is assured.

Write us for our free booklet explaining this super-metal.

TONCAN COPPER Mo-lyb-den-um IRON

CENTRAL ALLOY STEEL CORPORATION

Massillon and Canton, Ohio

World's Largest and Most Highly Specialized Alloy Steel Producers

Chicago Warehouse Metal and Furnace Supply Prices

AMERICAN ARTISAN is the only publication containing Western Metal, Furnace Supply and Hardware prices corrected weekly

METALS

PIG IRON

Chicago Fdy., No. 2	$20 00
Southern Fdy. No. 2	21 51
Lake Superior Charcoal	27 04
Malleable	20 00

FIRST QUALITY BRIGHT CHARCOAL TIN PLATES

IC	20x28 112 sheets	$22 50
IX	20x28	25 50
IXX	20x28 56 sheets	14 50
IXXX	20x28	15 50
IXXXX	20x28	17 00

TERNE PLATES

		Per Box
IC	20x28, 40-lb. 112 sheets	$26 70
IX	20x28, 40-lb. 112 sheets	29 70
IC	20x28, 25-lb. 112 sheets	22 30
IX	20x28, 25-lb. 112 sheets	25 30
IC	20x28, 20-lb. 112 sheets	20 25
IV	20x28, 20-lb. 112 sheets	23 00

"ARMCO" INGOT IRON PLATES

No. 8 ga.—100 lbs.	$4 15
3/16 in.—100 lbs.	4 05
¼ in.—100 lbs.	3 85

COKE PLATES

Cokes, 80 lbs., base, 20x28	$12 00
Cokes, 90 lbs., base, 20x28	12 30
Cokes, 100 lbs., base, 20x28	12 40
Cokes, 107 lbs., base, IC 20x28	12 75
Cokes, 135 lbs., base, IX 20x28	14 75
Cokes, 155 lbs., base, 2X, 56 sheets	8 50
Cokes, 175 lbs., base 3X, 56 sheets	9 85
Cokes, 195 lbs., base 4X, 56 sheets	10 35

BLUE ANNEALED SHEETS

Base 10 ga. per 100 lbs.	$3 35
"Armco" 10 ga. per 100 lbs.	4 15

ONE PASS COLD ROLLED BLACK

No. 18-20 per 100 lbs.	$3 85
No. 22 per 100 lbs.	4 00
No. 24 per 100 lbs.	4 05
No. 26 per 100 lbs.	4 15
No. 27 per 100 lbs.	4 20
No. 28 per 100 lbs.	4 30
No. 29 per 100 lbs.	4 45
No. 30 per 100 lbs.	4 55

"ARMCO" GALVANIZED

"Armco" 24 per 100 lbs. $6 15

GALVANIZED

No. 16 per 100 lbs.	$4 40
No. 18 per 100 lbs.	4 55
No. 20 per 100 lbs.	4 70
No. 22 per 100 lbs.	4 75
No. 24 per 100 lbs.	4 90
No. 26 per 100 lbs.	5 15
No. 27 per 100 lbs.	5 25
No. 28 per 100 lbs.	5 40
No. 30 per 100 lbs.	5 80

BAR SOLDER

Warranted 50-50 per 100 lbs.	$31 25
48-52 per 100 lbs.	30 50
45-55 per 100 lbs.	29 25
Plumbers' per 100 lbs.	27 25

ZINC

In Slabs $ 7 35

SHEET ZINC

Cask Lots (600 lbs.)	$11 75
Sheet Lots	12 75

BRASS

Sheets, Chicago base	24¼c
Mill base	23¼c
Tubing, brazed, Chicago base	31⅝c
Mill base	30⅝c
Tubing, seamless, Chicago base	29¼c
Mill base	28¼c
Wire, Chicago base	24⅝c
Mill base	23⅝c
Rods, Chicago base	22¼c
Mill base	21¼c

COPPER

Sheets, Chicago base	27⅝c
Mill base	26⅝c
Tubing, seamless, Chicago base	30¼c
Mill base	29¼c
Wire, plain rd., 8 B. & S. Ga. and heavier	25⅞c

LEAD

American Pig	$7 85
Bar	8 85

TIN

Bar Tin per 100 lbs.	$51 00
Pig Tin per 100 lbs.	50 00

HARDWARE, SHEET METAL SUPPLIES, WARM AIR FURNACE FITTINGS AND ACCESSORIES.

ASBESTOS

Paper up to 1/16	6c per lb.
Roll board	7½c per lb.
Mill board 3/32 to ⅛,	7½c per lb.
Corrugated Paper (250 sq. ft. to roll)	$6 00 per roll

BRUSHES

Furnace Pipe Cleaning Bristle with handle each	$0 75
Flue Cleaning Steel only, each	1 25

CEMENT, FURNACE

American Seal, 5-lb. cans, net	$ 45
American Seal, 10-lb. cans, net	85
American Seal, 25-lb. cans, net	2 25
Pecora per 100 lbs.	7 50

CHIMNEY TOPS

Adams' Revolving	Wt. Doz.	Price Doz.
4 in.	21 lbs.	$11 00
6 in.	24 lbs.	11 50
7 in.	30 lbs.	13 50
8 in.	33 lbs.	15 00
9 in.	51 lbs.	16 50
10 in.	56 lbs.	18 00
12 in.	66 lbs.	22 00
14 in.	110 lbs.	36 00

CLINKER TONGS

Each $1 50

CLIPS

Damper No-Rivet Steel, with tail pieces, per gross	$9 50
Rivet Steel, with tail pieces, per gross	7 50
Tail pieces, per gross	2 40

COPPERS—Soldering Pointed Roofing

3 lb. and heavier per lb.	40c
2½ lb. per lb.	45c
2 lb. per lb.	48c
1⅛ lb. per lb.	55c
1 lb. per lb.	60c

CORNICE BRAKES

Chicago Steel Bending Nos. 1 to 6B Net

CUT-OFFS

Gal., plain, round or cor. rd.

26 gauge	30%
28 gauge	35%

DAMPERS

"Yankee" Hot Air	
7 inch, each 20c, doz.	$1 60
8 inch, each 25c, doz.	2 20
9 inch, each 30c, doz.	2 60
10 inch, each 32c, doz.	2 80
Smoke Pipe 7 inch, doz.	$1 40
8 inch, doz.	2 20
9 inch, doz.	3 00
10 inch, doz.	3 75
12 inch, doz.	4 50

ADAMS No. 1 CHECK

Check and Collar Complete	
8 inch, each	2 00
9 inch, each	2 25
End Check Only 8 inch, each	1 60
9 inch, each	1 85
Collar Only 8 inch, each	50
9 inch, each	65

No. 2 CHECK

8 inch, each	1 00
9 inch, each	1 00
10% Disc. on Adams No. 1 and No. 2 Check	
Diamond Smoke Pipe 7 inch, doz.	$2 00
8 inch, doz.	3 20
9 inch, doz.	4 50
10 inch, doz.	6 00

Adams' Sheet Metal

7 inch, doz.	$1 60
8 inch, doz.	2 20
9 inch, doz.	2 60
10 inch, doz.	2 80
12 inch, doz.	3 50
14 inch, doz.	5 00

EAVES TROUGH

Galv. Crimpedge, crated	75-10%
Zinc, "Barnes"	60%

ELBOWS

Conductor Pipe	
Galv. plain or corrugated, round flat Crimp, 28 Gauge	60%
26 Gauge	45%
24 Gauge	15%
Galv. Terne Steel	
Plain Rd. and Rd. Corr.: 28 Ga.	60%
26 Ga.	45%
24 Ga.	15%
Square Corrugated	
No. 28 Gauge	50%
26 Gauge	35%
Portico Elbows	
Standard Gauge Conductor Pipe, plain or corrugated. Not nested	70 & 5%
Nested Solid	70 & 5%
Sq. Corr., A. & B. & Octagon	
28 Ga.	50%
26 Ga.	35%
Portico	
1", 1¼", 1½"	45%
Copper	
16 oz., all designs	40%
Zinc—	
All styles	60%

ELBOWS—Stove Pipe

1-piece Corrugated. Uniform "Milcor" No. 28 Gauge.	Blue Doz.
5-inch	$1 15
6-inch	1 25
7-inch	1 75
Special Corrugated	
6-inch	$1 00
7-inch	1 60
Adjustable—Uniform Blue	
"Milcor" No. 28 Gauge. Uniform Blue.	
5-inch	$1 60
6-inch	1 75
7-inch	2 10

WOOD FACES—60% off list.

FENCE

726-6-12½% (100 rods)	$28 68
1048-6-14½% (100 rods)	43 62

FILES AND RASPS

Heller's (American)	50-10%
American	60-10%
Arcade	50%
Black Diamond	50%
Eagle	50%
Great Western	50%
Kearney & Foot	50%
McClellan	50%
Nicholson	50%
Simonds	60%

FIRE POTS

Geo. W. Diener Mfg. Co.	Ea.
No. 02 Gasoline Torch, 1 qt.	$ 5 13
No. 2250, Kerosene, or Gasoline Torch, 1 qt.	6 50
No. 10 Tinner's Furn. Square tank, 1 gal.	11 20
No. 15 Tinner's Furn. Round tank, 1 gal.	10 70
No. 21 Gas Soldering Furnace	8 60
No. 110 Automatic Gas Soldering Furnace	10 50

GALVANIZED WARE

Pails (Galv. after made), 10-qt.	$2 00
Tubs (Galv. after made). No. 1	5 75
No. 2	6 50

GLASS

Single Strength, A, all brackets	85%
Single Strength, B, all brackets	87%
Double Strength, A, all brackets	85%
Double Strength, B, all brackets	87%

HANGERS

Conductor Pipe	
Milcor Perfection Wire	35%
Milcor Triplex Wire	10%
Eaves Trough	
Milcor Steel (galv. after forming) from List	50%
Milcor Selflock E. T. Wire, List	10%

HOOKS

Conductor	
"Direct Drive" Wrought Iron for wood or brick	15%

HUMIDIFIER

"Front-Rank," Automatic	
In single lots	60%
In lots of 10 or more	60-5%
In lots of 25 or more	60-10%
Vapor pans, etc., each	50%

LIFTERS

Stove Cover	
Coppered per gro.	$6 00
Alaska per gro.	4 75

MALLETS

Tinners	
Hickory per doz.	$2 35

MITRES

Galvanized steel mitres	
28 Ga.	70
26 Ga.	60-30

NAILS

Cut Steel, base	$4 00
Wire	
Common	$3 10
Cement Coated	3 15

(Continued on page 32)

LUPTON ELBOWS SAVE "ELBOW GREASE"

ROOFERS know the value of working with an elbow that is always standard in size and shape. It makes replacements easier, and it saves time and effort on a new job. Lupton Elbows have a 2½-inch graduated taper which gives an instant, water-tight joint, without the bother of solder. This feature is particularly helpful when you must work in cramped corners. A smooth, heavy galvanized job helps them stand the gaff of all kinds of weather. Lupton Elbows are the product of many years' experience. They will save you labor, time, and increase your reputation for good work. Ask for them at your jobber's. David Lupton's Sons Company, Allegheny Avenue and Tulip Street, Philadelphia, Pa.

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PASTE

Asbestos Dry Paste:

200-lb. barrel	$14 00
100-lb. barrel	7 50
50-lb. pail	4 25
10-lb. bag	1 00
5-lb. bag	55
2½-lb. cartons	25

POKERS, FURNACE

Each $0 75

POKERS, STOVE

Nickel Plated, coil handles, per doz. 1 10
W'r't Steel, str't or bent, per doz. $0 75

PIPE

Conductor

Cor. Rd., Plain Rd., or Sq.

Galvanized

Crated and nested (all gauges) 75-7½%
Crated and not nested (all gauges) 75-2½%

Furnace Pipe

Double Wall Pipe and Fittings ..... 50 & 10%
Single Wall Pipe, Round Galvanized Pipe .... 50 & 10%
Galvanized and Tin Fittings ..... 50 & 10%

Lead

Per 100 lbs. $12 50

Stove Pipe

"Milcor" "Titelock" Uniform Blue Stove

28 gauge, 6 inch U. C. nested	11 00
28 gauge, 6 inch U. C. nested	12 00
28 gauge, 7 inch U. C. nested	14 00
30 gauge, 6 inch U. C. nested	10 25
30 gauge, 6 inch U. C. nested	11 00
30 gauge, 7 inch U. C. nested	13 00

T-Joint Made up

6-inch, 28 ga. ... per doz. $ 3 40

All Zinc

No. 11, all styles 60%

PULLEYS

Furnace Tackle ... per doz. $0 85
..... per gro. 8 50
Furnace Screw (enameled) ..... per doz. 75

PUTTY

Commercial Putty, 100-lb. Kits $3 50

QUADRANTS

Malleable Iron Damper 10%

REDUCERS—Oval Stove Pipe

	Per Doz.
7—6, 28-gauge, 1 doz. in carton	$2 00

REGISTERS AND BORDERS

Baseboard, Floor and Wall

Cast Iron 20%
Steel and Semi-Steel 33⅓%
Baseboard, 1 piece 33⅓-20%
Baseboard, 2 piece 33⅓%
Wall 33⅓%
Adjustable Ceiling Ventilators 33⅓%

Register Faces—Cast and Steel

Japanned, Bronzed and Plated, 4x6 to 14x14 ..... 33⅓%
Large Register Faces—Cast, 14x14 to 38x42 ..... 50%
Large Register Faces—Steel, 14x14 to 38x42 ..... 60%

Ventilating Register

Per gross	9 00
Small, per pair	30
Large, per pair	50

RIDGE ROLL

Galv., Plain Ridge Roll, b'dld 75-15-5%
Galv., Plain Ridge Roll crated 75-15

SCREWS

Sheet Metal

7, ½x½, per gross $0 55
No. 10, ¾x3/16, per gross 65
No. 14, ⅞x¼, per gross.. 80

SHEARS, TINNERS' & MACHINISTS'

Viking $22 00

Lennox Throatless

No. 18 ..... 35%
Shear blades 10%
(f. o. b. Marshalltown, Iowa)

SHIELDS, ADJUSTABLE RADIATOR

No. 1 "Gem" 11" to 17" 30%
No. 2 "Gem" 14" to 24" 30%
No. 3 "Gem" 35" to 65" 30%

SHOES

Galv. 28 Gauge, Plain or corrugated round flat crimp.. 60%
26 gauge round flat crimp.. 45%
24 gauge round flat crimp.. 15%

SNIPS, TINNERS

Clover Leaf ..... 40 & 10%
National ..... 40 & 10%
Star 50%
Milcor ..... Net

SQUARES

Steel and Iron ..... Net
(Add for bluing $3 per doz. net)
Mitre ..... Net
Try ..... Net
Try and Bevel ..... Net
Try and Mitre ..... Net
Fox's ..... per doz. $6 00
Winterbottom's 10%

STOPPERS, FLUE

Commen ..... per doz. $1 10
Gem, No. 1 ..... per doz. 1 10
Gem, flat, No. 3 .... per doz. 1 00

VENTILATORS

Standard ..... 30 to 40%

WIRE

Black annealed wire, No. 9, per 100 lbs. $3 30
Galvanized barb wire, per 100 lbs. 3 90
Cattle Wire—galvanized catch weight spool, per 100 lbs.. 3 80
Galvanized Plain Wire, No. 9, per 100 lbs. 3 25

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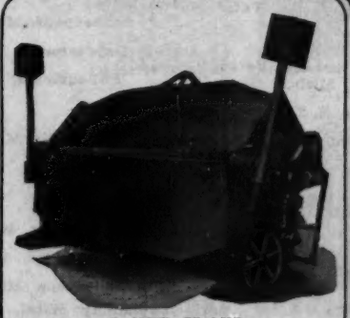
STEEL BENDING BRAKES AND FORMING PRESSES

The perfected result of over 30 years experience in the manufacture of sheet metal bending machines. Over 25,000 machines in use.



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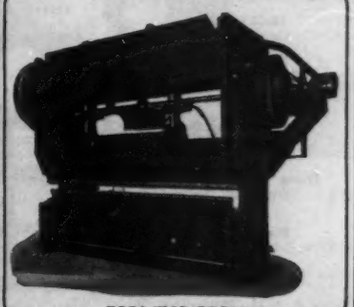

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NOW READY NEW REVISED EDITION

The NEW METAL WORKER PATTERN BOOK

A Complete and Systematic Course of Instruction in Pattern Cutting as Applied to All Branches of Sheet Metal Work

By Geo. W. Kittredge and Associates

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Indispensable as a Work of Reference for the Foreman and Mechanic

THIS work is the standard reference on all phases of pattern drafting and is recognized as the most practical and thorough text book on modern methods of developing and cutting patterns for sheet metal work. It covers the principles underlying practically every problem that is likely to come up in daily practice. Beginning with the selection and use of drawing tools, the author explains linear and geometrical drawing so clearly that one who has had no previous knowledge of arithmetic or drawing may understand these essentials and apply them. The most approved methods of pattern cutting are also given in the course of the work. As the book progresses the problems gradually become more advanced until the theory of triangulation is fully treated with many practical examples.

This volume does not presume upon any previous technical knowledge on the part of the beginner but aims to place before him all that is necessary to a thorough understanding of the work performed in the last chapter the practical problems which constitute the bulk of the book. No better text book for home study has ever been published.

The secret of success in sheet metal pattern cutting is in knowing how to apply the principles of geometry to your problems. Upon these underlying principles this book is written and ever since its publication it has been considered the standard authority on sheet metal pattern cutting and many affectionately term it "The Bible of the Trade."

LIST OF CHAPTER AND SECTION HEADINGS

1. Terms and Definitions. Alphabetical List of Terms. 2. Drawing Tools and Materials. 3. Linear Drawing. 4. Geometrical Problems. Construction of Regular Polygons. The Ellipse. The Volute. 5. Principles of Pattern Cutting. Parallel Forms. Regular tapering Forms. Irregular forms. 6. Pattern Problems. Parallel Forms (Miter Cutting). Regular Tapering Forms (Flaring Work). Irregular Forms (Triangulation). Mixed or Combination Forms. Automobile Patterns. Index.

This new edition has been carefully revised in order to keep it up to date and abreast of modern times and it will prove an infallible guide to everyone interested in sheet metal pattern drafting. Besides being a systematic treatise on pattern cutting it is also valuable as a reference book of pattern problems to be drawn from at convenience.

A glance at the list of chapter and section headings will give a clear idea of the scope and arrangement of the book.

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Mueller Furnace Co., L. J., Miwaukee, Wis.

Furnaces—Warm Air.
Agricola Furnace Co., Gadsen, Ala.
American Furnace Co., St. Louis, Mo.
Beckwith Co., The, Dowagiac, Mich.
Brillion Furnace Co., Brillion, Wis.
Canton Furnace & Mfg. Co., Canton, Ohio
Colburn Heater Co., Chicago, Ill.
Emrich Co., C., Columbus, Ohio
Farris Furnace Co., Springfield, Ill.
Floral City Heater Co., Monroe, Mich.
Forest City-Walworth Run Fdy., Cleveland, Ohio
Fox Furnace Co., Elyria, Ohio
Henry Furnace & Fdy. Co., Cleveland, Ohio
Hess-Snyder Co., Massillon, Ohio
Homer Furnace Co., Coldwater, Mich.
Lennox Furnace Co., Marshalltown, Ia.; Syracuse, N. Y.
Magirl Foundry & Furnace Co., P. H., Bloomington, Ill.
May Fieberger Furnace Co., Newark, Ohio
Marshall Furnace Co., Marshall, Mich.
Meyer Furnace Co., The, Peoria, Ill.
Midland Furance Co., Columbus, Ohio
Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
Mueller Furnace Co., L. J., Milwaukee, Wis.
Premier Warm Air Heater Co., Dowagiac, Mich.
Richardson & Boynton Co., New York, N. Y.
Robinson Co., A. H., Massillon, Ohio
Rybolt Heater Co., Ashland, Ohio
Standard Foundry & Furnace Co., De Kalb, Ill.
Schwab & Sons Co., R. J., Milwaukee, Wis.
Success Heater Mfg. Co., Des Moines, Ia.
Thatcher Co., Chicago, Ill.
XXth Century Heating & Ventilating Co., Akron, Ohio
Waterman-Waterbury Co., Minneapolis, Minn.
Western Steel Products Co., Duluth, Minn.
Wise Furnace Co., Akron, Ohio

Gas (Acetylene) Dissolved.
Prest-O-Lite Co., Inc., New York, N. Y.

Gas (Nitrogen).
Linde Air Products Co., New York, N. Y.

Gas (Oxygen).
Linde Air Products Co., New York, N. Y.

Glass—Wire.
Lupton's Sons Co., David, Philadelphia, Pa.

Grilles.
Auer Register Co., Cleveland, Ohio
Harrington & King Perforating Co., Chicago, Ill.
Hart & Cooley Co., New Britain, Conn.
Independent Reg. Co., Cleveland, Ohio
Tuttle & Bailey Mfg. Co., Chicago, Ill.

Grilles—Stove Front.
Tuttle & Bailey Mfg. Co., Chicago, Ill.

Guards—Machine and Belt.
Harrington & King Perforating Co., Chicago, Ill.

Handles—Boiler.
Berger Bros. Co., Philadelphia, Pa.

Handles—Soldering Iron.
Hyro Mfg. Co., New York, N. Y.

Hangers—Eaves Trough.
Berger Co., L. D., Philadelphia, Pa.
Horan Stay Hanger Co., Louisville, Ky.
Lupton's Sons Co., David, Philadelphia, Pa.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City

Heat Hustlers
American Foundry & Furnace Co., Bloomington, Ill

Heat Regulation Systems.
National Regulator Co., Chicago, Ill.
Thermo-Control Regulator Co., Youngstown, Ohio

Heaters—Cabinet.
Fox Furnace Co., Elyria, Ohio
Mueller Furnace Co., L. J., Milwaukee, Wis.
Waterman-Waterbury Co., Minneapolis, Minn.

Heaters—School Room.
Floral City Heater Co., Monroe, Mich.
Meyer Furnace Co., The, Peoria, Ill.
L. J. Mueller Furnace Co., Milwaukee, Wis.
Waterman-Waterbury Co., Minneapolis, Minn.

Hooks—Conductor.
Berger Co., L. D., Philadelphia, Pa.

Hotels.
Fort Shelby Hotel, Detroit, Mich.

Humidifiers.
Automatic Humidifier Co., Cedar Falls, Iowa
Chandler Pump Co., Cedar Rapids, Iowa
L. J. Mueller Furnace Co., Milwaukee, Wis.
Salada Mfg. Co., Minneapolis, Minn.

Lath—Expanding Metal.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City

Machines—Crimping.
Bertsch & Co., Cambridge City, Ind.

Machinery—Culvert.
Bertsch & Co., Cambridge City, Ind.

Machines—Tinsmith's.
Bertsch & Co., Cambridge City, Ind.
Dreis & Krump Mfg. Co., Chicago, Ill.
Interstate Machinery Co., Chicago, Ill.
La Salle Machine Works, Chicago, Ill.
Maplewood Machinery Co., Chicago, Ill.
Marshalltown Mfg. Co., Marshalltown, Iowa
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Peck, Stow & Wilcox Co., Southington, Conn.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Mandrels.
Hyro Mfg. Co., New York, N. Y.

Metals—Perforated.
Harrington & King Perforating Co., Chicago, Ill.

Miters.
Friedley-Voshardt Co., Chicago, Ill.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City

Miters—Eaves Trough.
Barnes Metal Products Co., Chicago, Ill
Lupton's Sons Co., David, Philadelphia, Pa
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City

Nails—Hardened Masonry.
Parker-Kalon Corp., New York, N. Y.

Nitrogen (Gas).
Linde Air Products Co., New York, N. Y.

Oil Burners.
McIlvaine Burner Corp., Evanston, Ill.
Northern Oil Burner Co., Minneapolis, Minn.
Preferred Oil Burners, Inc., Peoria, Ill.

Ornaments—Sheet Metal.
Friedley-Voshardt Co., Chicago, Ill.
Gerock Bros. Mfg. Co., St. Louis, Mo.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City

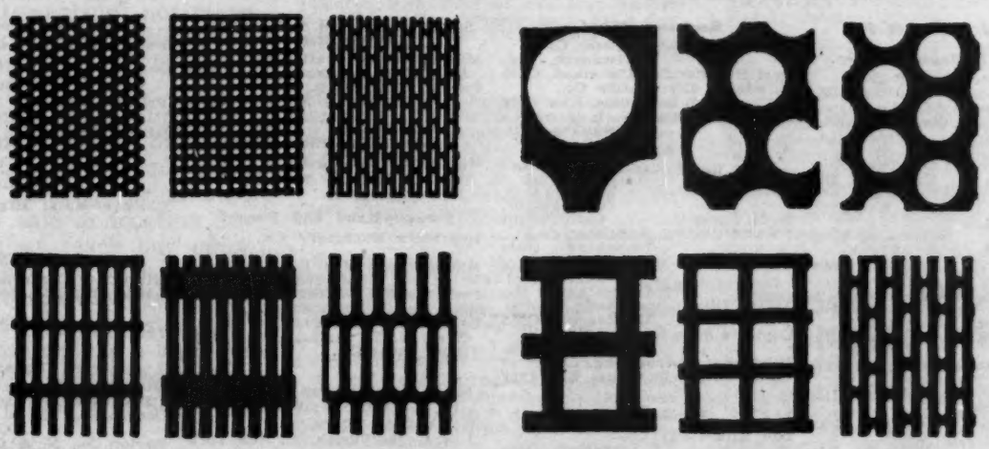
Oxygen (Gas).
Linde Air Products Co., New York, N. Y.

Paint.
Conners Paint Mfg. Co., Wm., Troy, N. Y.

Patterns—Furnace and Stove.
Cleveland Castings Pattern Co., Cleveland, Ohio
Quincy Pattern Co., Quincy, Ill.
Vedder Pattern Works, Troy, N. Y.

(Continued on page 36)

PERFORATED METALS



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BUYERS' DIRECTORY

(Continued from page 34)

Pipe and Fittings—Furnace.
Chicago Furnace Supply Co., Chicago, Ill.
Henry Furnace & Fdy. Co., Cleyeland, Ohio
Chas. Johnson Co., Peoria, Ill.
Lamneck Co., W. E., Columbus, Ohio
Meyer & Bro. Co., F., Peoria, Ill.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City
Mueller Furnace Co., L. J., Milwaukee, Wis.
Osborn Co., The J. M. & L. A., Cleveland, Ohio

Pipe and Fittings—Stove.
Meyer & Bro. Co., F., Peoria, Ill.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City

Pipe—Conductor.
Barnes Metal Products Co., Chicago, Ill.
Berger Bros. Co., Philadelphia, Pa.
Chicago Metal Mfg. Co., Chicago, Ill.
Dieckmann Co., Ferdinand, Cincinnati, Ohio
Friedley-Voshardt Co., Chicago, Ill.
Lupton's Sons Co., David, Philadelphia, Pa.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City
New Jersey Zinc Sales Co., The New York, N. Y.
Wheeling Corrugating Co., Wheeling, W. Va.

Presses.
La Salle Machine Works, Chicago, Ill.

Pipe Covering.
Sall Mountain Co., Chicago, Ill.

Punches.
Bertsch & Co., Cambridge City, Ind.
Interstate Machinery Co., Chicago, Ill.
La Salle Machine Works, Chicago, Ill.
Peck, Stow & Wilcox Co., Southington, Conn.
Ryerson & Son, Inc., Jos. T., Chgo, N. Y., St. L., Det., Cleve.

Punches—Combination Bench and Hand.
Hyro Mfg. Co., New York, N. Y.
Ryerson & Son, Inc., Jos. T., Chgo, N. Y., St. L., Det., Cleve.

Punches—Hand.
Hyro Mfg. Co., New York, N. Y.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Putty—Stove.
Connors Paint Mfg. Co., Wm., Troy, N. Y.

Radiator Cabinets.
The Hart & Cooley Mfg. Co., New Britain, Conn.
Tuttle & Bailey Mfg. Co., Chicago, Ill.

Radiators—Shields.
Beh & Co., Inc., New York, N. Y.

Ranges—Combination Gas & Coal
Thatcher Co., Newark, N. J.

Register Shields.
Beh & Co., Inc., New York, N. Y.
Hall-Neal Furnace Co., Indianapolis, Ind.

Registers—Warm Air.
Auer Register Co., Cleveland, Ohio
Forest City-Walworth Run Foundries Co., Cleveland, Ohio
Hart & Cooley Co., New Britain, Conn.
Henry Furnace & Fdy. Co., Cleveland, Ohio
Independent Register & Mfg. Co., Cleveland, Ohio
Lamneck & Co., W. E., Columbus, Ohio
Meyer & Bro. Co., F., Peoria, Ill.
Milwaukee Corrugating Co., Mil., Ch'go. La Crosse, Kan. City
Mueller Furnace Co., L. J., Milwaukee, Wis.
Tuttle & Bailey Mfg. Co., Chicago, Ill.
Waterloo Register Co., Waterloo, Iowa

Registers—Wood.
American Wood Register Co., Plymouth, Ind.
Auer Register Co., Cleveland, Ohio
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City
Mueller Furnace Co., L. J., Milwaukee, Wis.

Regulators—Heat.
National Regulator Co., Chicago, Ill.
H. M. Sheer Co., Chicago, Ill.
Thermo-Control Regulator Co., Youngstown, Ohio

Ridging.
Armco Distributors Ass'n of America. Middletown, Ohio
Lupton's Sons Co., David, Philadelphia, Pa.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City

Rivets—Stove.
The Kirk-Latty Co., Cleveland, Ohio
Lamson & Sessions Co., Cleveland, Ohio
Ryerson & Son, Inc., Jos. T., Ch'go, N. Y., St. L., Det., Cleve.

Rods—Stove.
The Kirk-Latty Co., Cleveland, Ohio
Lamson & Sessions Co., Cleveland, Ohio

Rolls—Forming.
Bertsch & Co., Cambridge City, Ind.

Roofing Cement.
Connors Paint Mfg. Co., Wm., Troy, N. Y.

Roofing Tile—Clay and Shale.
B. Mifflin Hood Co., Daisy, Tenn.

Roof—Flashing.
Milwaukee Corrugating Co., Milwaukee, Wis

Roofing—Iron and Steel.
Armco Distributors Ass'n of America. Middletown, Ohio
Central Alloy Steel Corp., Massillon, Ohio
Friedley-Voshardt Co., Chicago, Ill.
Inland Steel Co., Chicago, Ill.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Ryerson & Sons, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.
Wheeling Corrugating Co., Wheeling W. Va.

Roofing—Tin.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City
Taylor Co., N. & G., Philadelphia, Pa.
Wheeling Corrugating Co., Wheeling W. Va.

Roofing Tools.
Wm. Eiermann, Brooklyn, N. Y.

Roofing—Zinc.
New Jersey Zinc Sales Co., The, New York, N. Y.

Rubbish Burners.
Hart & Cooley Co., New Britain, Conn.

Schools—Sheet Metal Pattern Drafting.
St. Louis Technical Institute, St. Louis, Mo.

Schools—Warm Air Heating.
St. Louis Technical Institute, St. Louis, Mo.

Screws—Hardened Metallic Drive.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City
Parker-Kalon Corp., 200 Varick St., New York

Screws—Hardened Self-Tapping, Sheet Metal.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City
Parker-Kalon Corp., 200 Varick St., New York

Screens—Perforated Metal.
Harrington & King Perforating Co., Chicago, Ill.

Shears—Hand and Power.
Interstate Machinery Co., Chicago, Ill.
Marshalltown Mfg. Co., Marshalltown, Iowa
Peck, Stow & Wilcox Co., Southington, Conn.
Ryerson & Son, Inc., Jos. T., Ch'go, N. Y., St. L., Det., Cleve.
Viking Shear Co., Erie, Pa.

Sheet Metal Screws—Hardened, Self-Tapping.
Parker-Kalon Corp., 200 Varick St., New York

Sheets—Black and Galvanized.
Armco Distributors Ass'n of America, Middletown, Ohio
Central Alloy Steel Corp., Massillon, Ohio
Inland Steel Co., Chicago, Ill.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Ryerson & Son, Inc., Jos. T., Ch'go, N. Y., St. L., Det., Cleve.
Taylor Co., N. & G., Philadelphia, Pa.
Wheeling Corrugating Co., Wheeling, W. Va.

Sheets—Iron.
Armco Distributors Ass'n of America, Middletown, Ohio
Central Alloy Steel Corp., Massillon, Ohio
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Sheets—Tin.
Taylor Co., N. & G., Philadelphia, Pa.

Sheets—Zinc.
New Jersey Zinc Sales Co., The, New York, N. Y.

Shingles and Tiles—Metal.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City
Wheeling Corrugating Co., Wheeling, W. Va.

Sifters—Ash.
Diener Mfg. Co., G. W., Chicago, Ill.

Sky Lights.
Lupton's Sons Co., David, Philadelphia, Pa.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City

Snips.
Peck, Stow & Wilcox Co., Southington, Conn.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Solder.
Chicago Solder Co., Chicago, Ill.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City

Soldering Furnaces.
Burgess Soldering Furnace Co., Columbus, Ohio
Diener Mfg. Co., G. W., Chicago, Ill.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Soldering Supplies
Chicago Solder Co., Chicago, Ill.

Specialties—Hardware.
Diener Mfg. Co., G. W., Chicago, Ill.

Stars—Hard Iron Cleaning.
Fanner Mfg. Co., Cleveland, Ohio

Statuary.
Friedley-Voshardt Co., Chicago, Ill.
Gerock Bros. Mfg. Co., St. Louis, Mo.

Steel Pipe—Welded.
Chicago Metal Mfg. Co., Chicago, Ill.

Stove Pipe Reducers.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City

Thatcher Co., Newark, N. J.

Tinplate.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Taylor Co., N. & G., Philadelphia, Pa.

Tools—Roofers.
Wm. Eiermann, Brooklyn, N. Y.

Tools—Tinsmith's.
Bertsch & Co., Cambridge City, Ind.
Dries & Krump Mfg. Co., Chicago, Ill.
Hyro Mfg. Co., New York, N. Y.
Interstate Machinery Co., Chicago, Ill.
Maplewood Machinery Co., Chicago, Ill.
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Peck, Stow & Wilcox Co., Southington, Conn.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.
Viking Shear Co., Erie, Pa.

Torches.
Burgess Soldering Furnace Co., Columbus, Ohio
Diener Mfg. Co., G. W., Chicago, Ill.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Trade Extension.
American Zinc Institute, New York, N. Y.
Copper & Brass Research Association, New York, N. Y.
Sheet Steel Trade Extension Committee, Pittsburgh, Pa.

Trimmings—Stove.
Fanner Mfg. Co., Cleveland, Ohio

Vacuum Cleaner—Furnace.
Brillion Furnace Co., Brillion, Wis.
National Super Service Co., Toledo, Ohio

Ventilators.
Aeolus Dickinson Co., Chicago, Ill.
Akrat Ventilators, Inc., Chicago, Ill.
Arex Company, Chicago, Ill.
Berger Bros. Co., Philadelphia, Pa.
Friedley-Voshardt Co., Chicago, Ill.
Kernchen Co., Chicago, Ill.
Lupton's Sons Co., David, Phidadelphia, Pa.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City
Standard Ventilator Co., Lewisburg, Pa.

Ventilators—Ceiling.
Hart & Cooley Co., New Britain, Conn
Henry Furnace & Fdy. Co., Cleveland, Ohio

Windows—Steel.
Lupton's Sons Co., David, Philadelphia, Pa.

Zinc.
American Zinc Institute, New York, N. Y.
New Jersey Zinc Co., The, New York, N. Y.

WANTS AND SALES

Yearly subscribers to the AMERICAN ARTISAN may insert advertisements of not more than fifty words in our Want and Sales Columns WITHOUT CHARGE.

Such advertisements, however, must be limited to help or situation wanted, tools or equipment for sale, to exchange or to buy, business for sale or location desired and must reach our office by Thursday of the week of publication. This privilege is not extended to manufacturers or jobbers—or those making a business of buying and selling used machines—employment agencies and brokers.

When sending advertisement state whether your name or blind number is to be used.

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Lightning Rods—Dealers who are selling Lightning Protection will make money by writing to us for our latest Factory to Dealer Prices. We employ no salesmen and save you all overhead charges. Our Pure Copper Cable and Fixtures are endorsed by the National Board of Fire Underwriters and hundreds of dealers. Write today for samples and prices. L. K. Diddle Company, Marshfield, Wis.

For Sale—Sheet metal shop in Houston, Tex. Shop 24x30, with store room. Tools, including 8 foot brake with all necessary hand tools for general sheet metal work—also welding torch complete. Good amount of Marine work. Ideal location and a good chance for a good man. Will sacrifice tools complete and stock for $500.00 and give 3 year lease at $40.00 per month. A splendid opportunity for any man. Address F499, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

For Sale or Exchange—General sheet metal, furnace and roofing business located on west side of Chicago. Great chance for mechanic who wants to get ahead. Established 27 years, fully equipped, ideal location. Will sell at a bargain and assist buyer to get started. Wish to retire on account of age and health. Address E499, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Growing sheet metal shop in Portland, Oregon, wants experienced man to invest $3,000 or more, with services. Blow pipe, furnace, and general sheet metal work. Practical mechanic or estimator and superintendent wanted. Address R498, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

For Sale—Hardware, plumbing and sheet metal shop. Good tools and clean stock. Building 34 by 36. Seven room house and bath. Two miles from Milton Lake. Sewer and water going in now. Plenty of work. This is priced to sell. Address H. F. Cain, Diamond, Ohio. A498

Wanted—Going sheet metal and furnace business. Will exchange six-room modern residence in St. Louis valued at $5,500. Address J497, AMERICAN ARTISAN.

SITUATION WANTED

Position wanted by first class sheet metal worker. 20 years in all branches of the trade. Address E498, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

SITUATION WANTED

Experienced furnace salesman will be open May 1st for position; thoroughly familiar with Standard Code; can help dealers on installation. Special attention given to school and church jobs. Acquainted with most of the best dealers in Wisconsin. Furnish best of references. Address 745 47th street, Milwaukee, Wisconsin. P-498

Position wanted by married man, sober and a steady worker. Operated own shop for two years. Eight years' experience in plumbing, gas fitting, heating, and tin shop work. Prefer Washington, Oregon or California. Can go at once. Address D498, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

Situation wanted by tinner and furnace man and general handy man around country hardware store. Can also do pump work and some plumbing. Address 616 Manomin Avenue, St. Paul, Minnesota. O-498

A first class hardware man, capable of taking charge and running the business, seeks position with a reliable company. Address G. O. Crouch & Son, Chattanooga, Tennessee. M-498

HELP WANTED

Wanted — Combination sheet metal worker and plumber. Must be A-1 mechanic. Prefer middle-aged married man who is able to handle all kinds of work required in a small country town of 1,000 population. A steady job for the man with ambition. Unless you are sober, honest, industrious, and steady don't waste your time answering this ad. Address L497, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Wanted—Experienced sheet metal man to invest $2,000 or more, with services, in growing and well established power shop in Portland, Oregon, doing a general sheet metal, furnace, blow pipe and roofing business. A good opportunity for right man. Address M497, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Wanted — Combination sheet metal worker and plumber. Must be A1 mechanic on all kinds of sheet metal work. Steady year-round work to man of ability and good habits. Prefer a man under 42 years. Give age, reference and wages wanted in first letter. Address Milton L. Kistler, Alexander City, Ala. G-498

Wanted—Old established business wants manager who understands heating, ventilating and sheet metal work. Salary and commission. Best city on Pacific coast. Seattle, Washington. Address C498, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

Wanted—An all around first class tinner who can work out his own plans and do all work connected with a tin shop. Some furnace work. Must be reliable and sober at all times. Address Z498, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Illinois.

Wanted at Once—All around man to do class of work that comes in a country tin shop. Must be able to do plumbing and drive a car. Want a sober man and one who will be on the job. Wages $30.00 week, year around. Address O. L. Doward, Mt. Morris, Illinois. T-498

Wanted—Experienced salesman with car to sell Genasco roofing. Large territory, liberal commission. Address L. R. Hamman Roofing and Sheet Metal Works, 507-511 E. Prairie St., Decatur, Ill. Y498

Wanted—Furnace salesman by Midwestern jobber. Must be familiar with the code and fan practice. Address A499, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

HELP WANTED

Wanted—Skilled workman who has had experience in the manufacture of steam tables and all kinds of kitchen equipment; good position. Address S498, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

Wanted — Combination sheet metal worker and plumber. Prefer man who is experienced in furnace work, gutter and general repair work who can also do some plumbing. Address Hinckley Hardware Company, Hinckley, Illinois. W-498

Wanted—Good tinner for general sheet metal and furnace work. Give age and reference. Address Seither & Cherry Co., Keokuk, Iowa. B498

TINNERS' TOOLS

For Sale—1 small turning machine, also large one, burring, wire and setting down machine, small beader with 5 sets of rolls, 20-inch bar folder, 17-inch groover, 30-inch square shear, 2x31-inch rollers, 8-foot Chicago steel brake. All for $195 f. o. b. Grand Rapids, Michigan. Address Albert Zylstra, 1233 Muskegon Avenue, N. W. Grand Rapids, Michigan. K-498

For Sale—Full set of tinners' tools, including 8-foot steel brake, 30-inch bar folder, 30-inch square shear, 30-inch rolls, groover, crimper, burring, wire, thick-edge. All machines with standards and in good condition. A bargain if taken at once. Address L498, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

For Sale—Full set of tinners tools. Everything needed to do a general sheet metal business. Will sell cheap for cash. Write for particulars and price. G. B. Fadner, 607 J Avenue West, Cedar Rapids, Iowa. Z497

Wanted—One 30-inch or 36-inch squaring shear. One 36-inch roll. Want second hand shears and roll but they must be in good condition. Cheapest price and cash. Address D499, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Illinois.

Wanted—Riveting machine that will handle 14 gauge corrugated culverts and lighter; must be in first class condition. Address Wendland Sheet Metal Works, 30 West Concha Avenue, San Angelo, Texas. H-498

For Sale—Complete set of tinners' tools, including 8-foot Chicago Brake 30-inch Square Shears, 36-inch Bar Folder. Good location for shop in new oil town. Address C. McEntarfer, Valley Center, Kansas. J-498

For Sale—All or any part of complete set of tinners tools. List and prices furnished on application. Address The J. H. Linder Hardware Company, Golden, Colorado. C499

MISCELLANEOUS

For Sale—Metal building construction. This is an innovation and it will pay you to investigate. Address G499, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

For Sale—Sturtevant Vacuum Cleaner used one season. Good as new. Cost $250.00. First $125.00 takes it. Address Service Plumbing and Heating Shop, Fremont, Michigan. H499

For Sale—One Delco lighting plant. Address Edward Lloyd, Route 2, Whitewater, Wisconsin.

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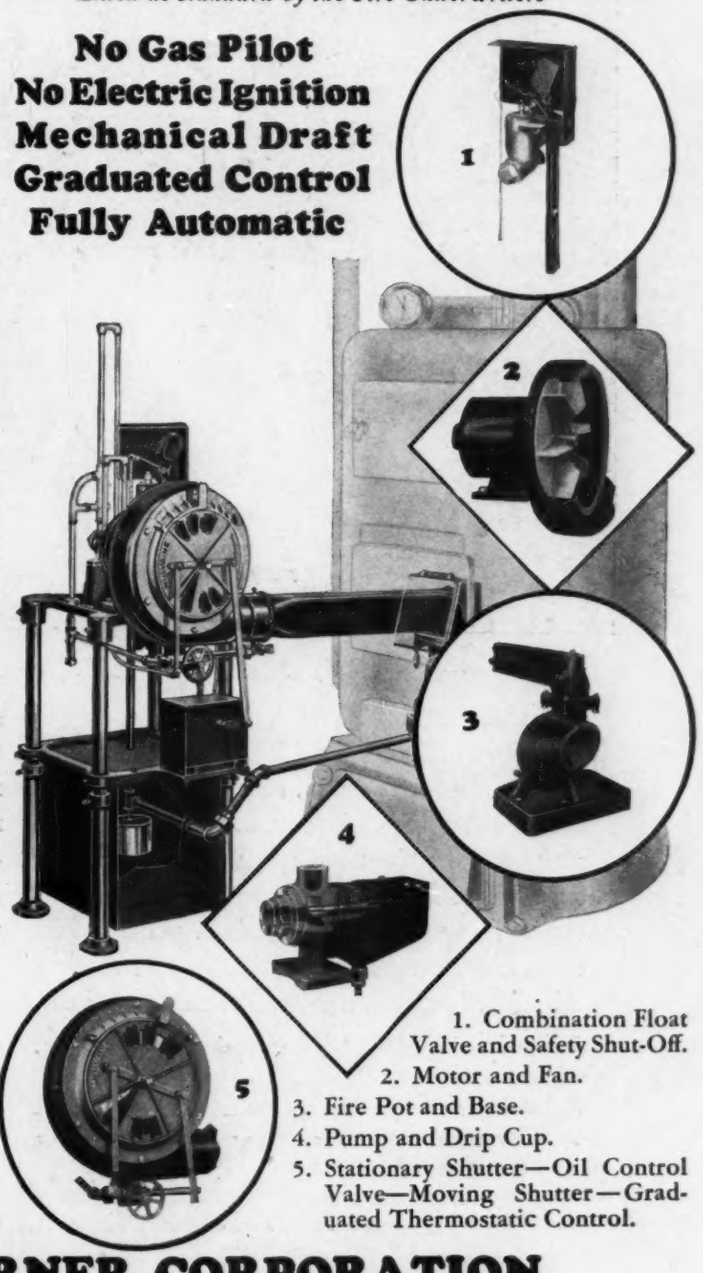

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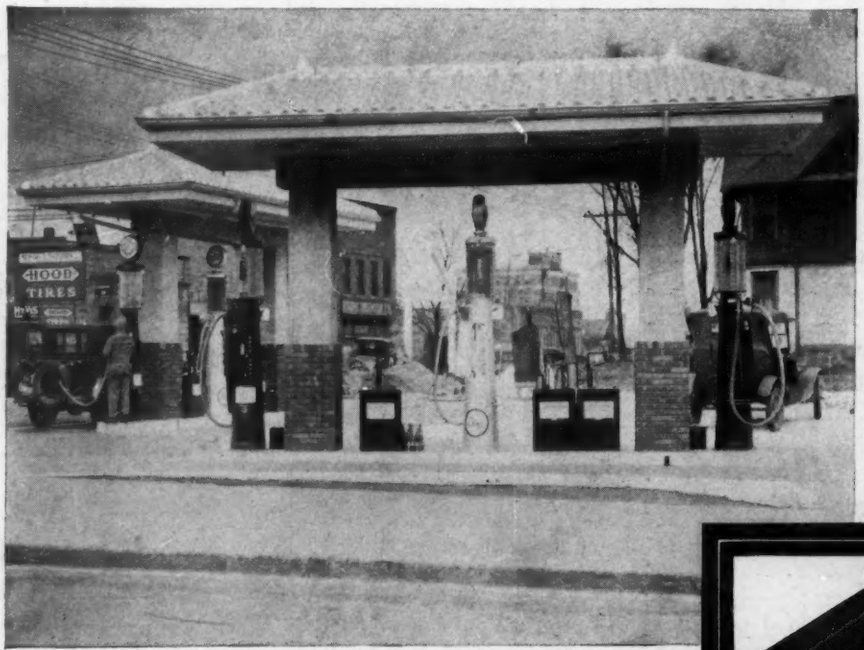

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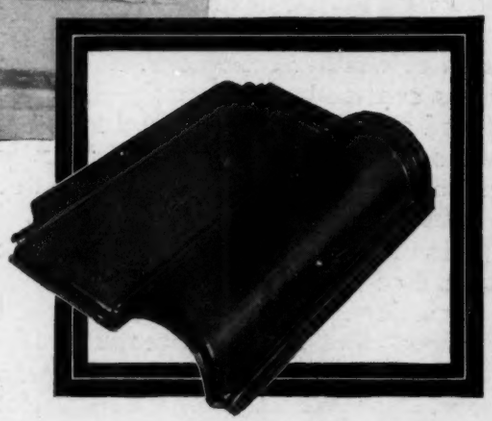

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